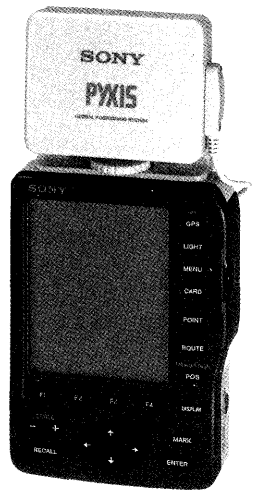
IPS-760

SERVICE MANUAL



US Model
Canadian Model
AEP Model
E Model
Tourist Model
UK Model
Australian Model

PYXIS

SPECIFICATIONS

Physical characteristics

Dimensions	Overall:	Approximately 110 x 230 x 34 mm (w/h/d) (4 3/8 x 9 1/8 x 1 3/8 in)
	Antenna:	Approximately 90 x 70 x 25 mm (w/h/d) (3 5/8 x 2 7/8 x 1 in)
	Display/Keyboard:	Approximately 110 x 152 x 34 mm (w/h/d) (4 3/8 x 6 x 1 3/8 in)
Weight	Approximately 833 g (1 lb 13 oz), including six R6 (size AA) batteries and two cards	
Display	STN-type dot matrix, 256 x 320 dots	
Operating environment		
	Waterproof	
	Operating temperature	
		Antenna: -20 °C ~ 70 °C (-4.0 °F ~ 158 °F)
		Display/Keyboard: 0 °C ~ 40 °C (32 °F ~ 104 °F)

Electrical characteristics

Reception	1575.42 MHz, C/A Code
	8 channel (simultaneous track system)
	Sensitivity: -130 dBm
Power requirements	
	R6 (size AA) alkaline batteries x 6 (not supplied)
	Battery life: about 4 hours of continuous operation, about 2 hours using the backlight
	NP-IPS76 Rechargeable battery pack (not supplied)
	Battery life: about 3 hours of continuous operation
	External power voltage 6V DC

Data Characteristics

Accuracy	Position:	9 m (30 ft) with DOP ≤ 4 and S/A OFF
	Velocity:	0.56 km/h (0.35 mph, 0.3 knots) with DOP ≤ 4 and S/A OFF
	Altitude:	25 m (83 ft) with DOP ≤ 4 and S/A OFF
Positioning time	Approximately 1 minute	
Data renewal	Approximately 1 second	

Operational Characteristics

Maximum velocity	500 km/h (310 mph, 270 knots)	
Memory capacity	96 kilobytes	
	For example:	Number of points 400
		Number of routes 50
		Number of tracks 5

Design and specifications are subject to change without notice.

Note:
This appliance conforms with EEC Directive 87/308/EEC regarding interference suppression.

GPS (Global Positioning System) RECEIVER

SONY®

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CAUTION

Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the equipment manufacture. Discard used batteries accordintg to manufacture's instructions.

ADVERSEL !

Lithiumbatteri—Eksplosionsfare ved fejlagtig håndtering.
Udskiftning må kun ske med batteri
af samme fabrikat og type.
Lever det brugte batteri tilbage til leverandcren.

ADVARSEL

Lithiumbatteri—Eksplosjonsfare.
Ved utskifting benyttes kun batteri som
anbefalt av apparatfabrikanten.
Brukt batteri returneres apparatleveranderen.

VARNING

Explosionsfara vid felaktigt batteribyte.
Använd samma batterityp eller en likvärdig typ som
rekommenderas av apparattillverkaren.
Kassera använt batteri enligt gällande föreskrifter.

VAROITUS

Paristo voi räjähtää, jos se on virheellisesti asennettu.
Vaihda paristo ainoastaan laitevalmistajan suosittelemaan
tyyppiin. Hävitä käytetty paristo valmistajan ohjeiden
mukaisesti.

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

ATTENTION AU COMPOSANT AYANT RAPPORT À LA SÉCURITÉ!

LES COMPOSANTS IDENTIFIÉS PAR UNE MARQUE ⚠ SUR LES DIAGRAMMES SCHÉMATIQUES ET LA LISTE DES PIÈCES SONT CRITIQUES POUR LA SÉCURITÉ DE FONCTIONNEMENT. NE REMPLACER CES COMPOSANTS QUE PAR DES PIÈCES SONY DONT LES NUMÉROS SONT DONNÉS DANS CE MANUEL OU DANS LES SUPPLÉMENTS PUBLIÉS PAR SONY.

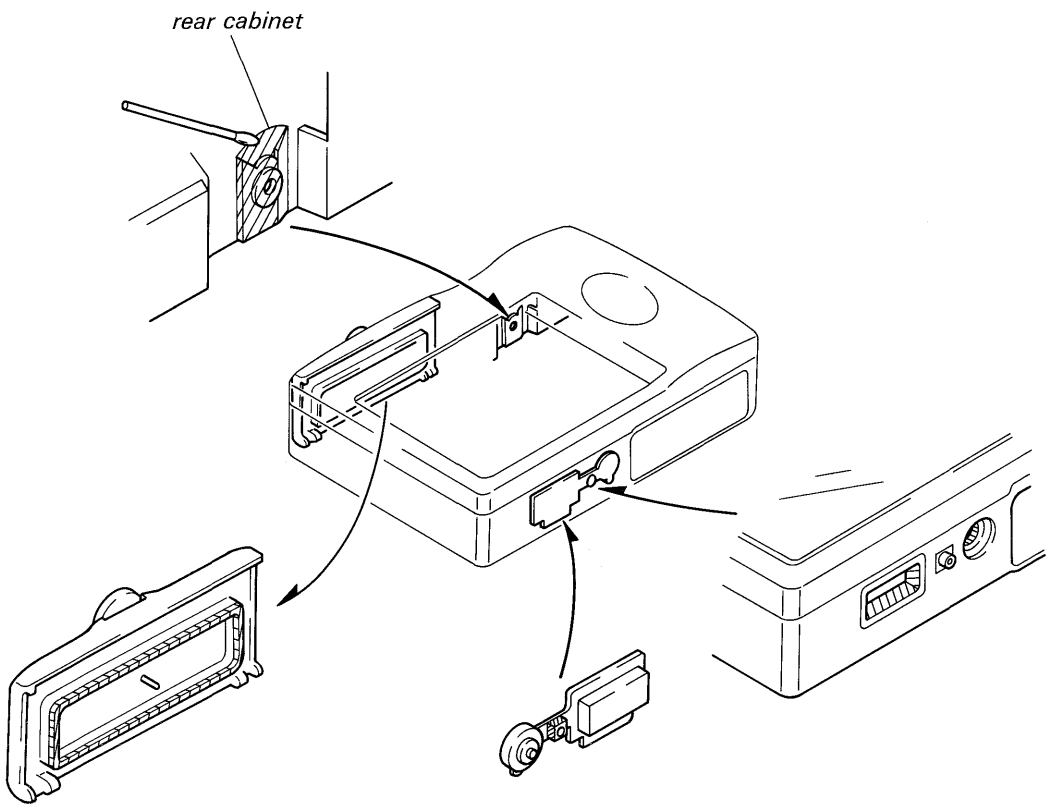
SERVICE NOTE

〔Caution on Service〕

Drip-proof freatment

· The following must be executed when the cabinet is replaced in the service.

Applicator SONY Grease SGL-505 (7-662-010-04) to the hatched portion shown in figure using an applicator, etc.



Features

Congratulations on your purchase of the Sony IPS-760 GPS (Global Positioning System) Receiver. The IPS-760 uses GPS signals to provide you with essential navigation information, such as latitude, longitude, and velocity.

You can use the IPS-760 to help you navigate in a variety of locations and activities including:

- At sea: Boating, fishing, sailing
- On land: Hiking, mountaineering, driving
- In the air: Flying, hang-gliding

You can use the IPS-760 to:

- Determine your current position
  - display your current position.
  - store your current position.
- Navigate to your destination
  - store the latitude and longitude data of the positions.
  - display the distance and the direction to your destination.
  - plan your navigation route, for navigating to your destination via the route
  - notify you of course deviation.
  - notify you of reaching a destination point.
- Display and track the course travelled.

The IPS-760 is also versatile, allowing you to set it up and use it in a variety of ways. You can:

- Remove the antenna from the display/keyboard unit for remote installation.
- Light the display screen, buttons, and keys so you can use the unit even in dark places.
- Use IC memory cards in the two available card slots. You can use these cards to store navigation information and display maps using an IC memory cards that contain map data.
- Output data via an RS-232C port using the Interface Module (not supplied).

Note:
For nautical and aeronautical navigation, use this unit only as a backup and supplement to the navigation charts required by the relevant regulatory body.

About This Manual

Using this manual you will be able to setup and operate IPS-760 – even if you are unfamiliar with GPS or navigation concepts.

This manual is divided into the following chapters:

- Chapter 1, "Setting Up the Unit," describes how to set up the unit. It guides you through the setup and initial settings you must make before you can start using the unit.
- Chapter 2, "Getting Started With the Unit," describes how to use the unit. It also presents an overview of the operation modes and explains how to use the display and operation keys.
- Chapter 3, "Customizing the Unit," describes how to change the unit's default settings to suit your individual needs. You can change the display, positioning conditions, clock, alarms, and system settings.
- Appendixes provide miscellaneous information about the unit, such as optional accessories, troubleshooting tips, reference charts, display symbols and abbreviations, and specifications.

GPS Overview

This section introduces you to the GPS system, which is the system used by the unit to acquire navigation information.

What is GPS?

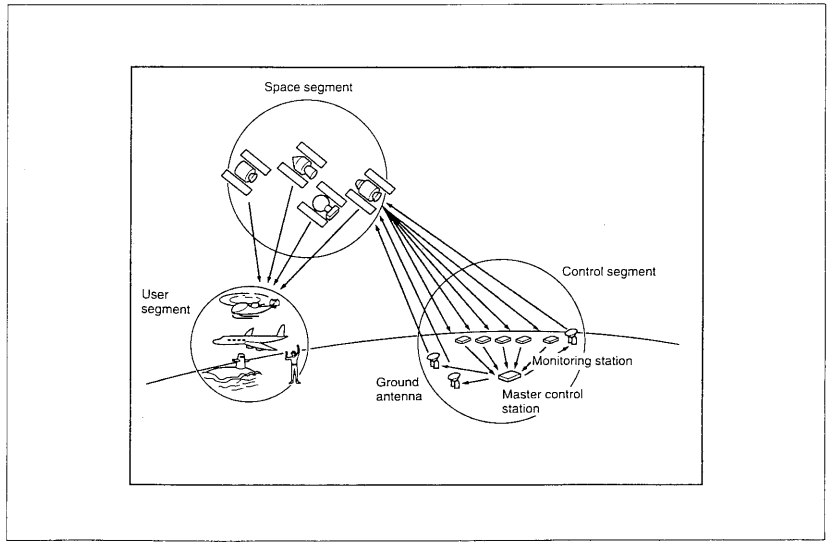
The Global Positioning System (GPS) is a satellite-based navigation system developed and maintained by the United States Department of Defense (DoD). The system, which was originally designed for military purposes, includes a separate signal (C/A code) for civilian use.

A GPS receiver, such as the IPS-760, uses the GPS satellite signals to determine your precise geographic location, including latitude, longitude, and altitude. The GPS signals are available worldwide 24 hours a day.

Segments of the GPS system

The GPS system is made up of three segments:

- The space segment, which will – when completed – be composed of 21 satellites (and three operational spares) in six orbits. The satellites transmit signals with highly accurate orbital and timing information.
- The control segment, which consists of a master control station, five remote monitoring stations, and three ground antennas. The monitoring stations track the GPS satellites. The data gathered by the monitoring stations is processed by the master control station, which updates the orbital information of each satellite. The updated information is transmitted to each GPS satellite by the ground antennas.
- The user segment, which consists of the GPS receiver.

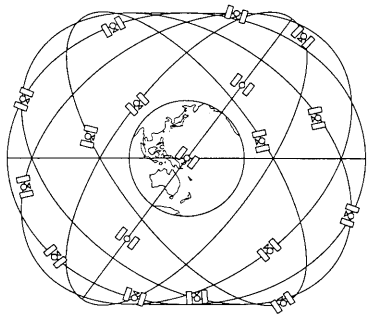


This section is extracted from instruction manual.

GPS Overview

Calculating positions

The GPS satellites transmit signals relative to their position and the timing signal. By multiplying the time the timing signal takes to reach the receiver by the velocity of radio wave (3×10^8 m/s), the GPS receiver calculates the distance between the satellite and the receiver itself. The receiver's position is defined by the cross point of spheres whose radius correspond with the distance from each satellite. Therefore, the receiver can calculate its position: latitude, longitude, altitude* when it receives signals from four satellites.



* The unit calculates the altitude based on the World Geodetic System (WGS84) coordinates. This altitude is not relative to the height above sea level.

Methods of position

The unit can provide you with either a two- or three-dimensional position, depending on satellite availability.

- Two-dimensional position: The unit uses three satellites to determine a two-dimensional position: latitude and longitude.The unit employs the altitude that has been calculated during the latest positioning.
- Three-dimensional position: The unit uses four satellites to determine a three-dimensional position: latitude, longitude, and altitude.

GPS system specifications

Satellite altitude:	About 20,000 km (10,900 miles)	
Satellite orbit:	About a 12-hour-cycle elliptical orbit	
Signal format:	P code – used for military applications; C/A code – used for civilian applications. The IPS-760 uses the C/A (Coarse Acquisition) code signals.	
C/A code:	Frequency	1575.42 MHz
	Clock	1.023 Mbps
	Orbit data speed	50 bps
	Signal strength	–160 dBw
Modulation:	Direct Sequence	
Accuracy:	30 m (98 feet), DOP** ≤ 6, with S/A*** OFF	

** DOP (Dilution of Precision) is an indication of the accuracy of the position based on satellite geometry (the position of the satellites relative to the earth). When the GPS satellite constellation is complete, there will be a minimum of five satellites in view with a DOP of six or less to any user worldwide.

*** S/A (Selective Availability) is a method for the government to control the accuracy of the GPS signals. With S/A on, the accuracy may be degraded to 100 meters.

Warning:
GPS system signals are maintained and controlled by the United States Department of Defense (DoD). Without notice, the DoD can change the characteristics of this signal, which will degrade the accuracy of this unit. Use the IPS-760 at your own risk.

Receiving GPS Satellite Signals

This section briefly explains the GPS satellite reception.

Guidelines for reception

To ensure the best possible satellite reception, follow these guidelines when setting up and using the unit:

- Place the antenna horizontally, with no line-of-sight obstructions. The fewer obstructions, the better the unit can receive satellite signals.
- Keep in mind that certain objects, such as dense tree coverage, buildings, your body, etc., may interfere with the GPS satellite signal reception.
- The satellite signals can be received through certain materials such as glass, fiberglass, or acrylic.
- As the satellites move low on the horizon, reception may become poor.
- The satellite constellation is not yet complete: not all satellites are in orbit, and the existing satellites undergo periodic testing. Therefore, there may be times when there are not enough satellites to determine your position.

About the positioning time

The GPS satellites transmit orbital and timing information. This information is called a "navigation message" and is transmitted in 30 seconds of data row. The orbital information included in the navigation message is called the "broadcast ephemeris." 21 satellites (and 3 operational spares) transmit the navigation message with their own orbital information and timing information. The common information such as orbital information for all satellites are also included in the transmitted information, which is called an "almanac." Almanac data is used to determine the positions of each satellite when acquiring the current position.
If the GPS receiver has the orbital information for all satellites in its memory and knows the approximate allocation of the satellites, and then it receives 30 seconds of data row once and stores them in its memory, it can continuously calculate its current position. The data is valid for a few hours.

The unit can calculate your current position in several minutes after you input your approximate current position on initial setting. After turning on the unit, if you wait for about one minute to continuously receive the orbital information in a location with no line-of-sight obstructions, you can acquire your current position quickly. It may take a little longer to acquire your current position while moving because the unit receives the orbital information intermittently.

Because the unit is an 8-channel parallel receiver, it can search for the satellites that are not used for calculating the current position, and gather the orbital information.

Under the following conditions, the unit will take about 20 minutes (or more than one hour, depending on the reception condition) to acquire the current position:
- When you execute the "GPS Reset" option
- When you replace the built-in lithium batteries

GPS Coordinates

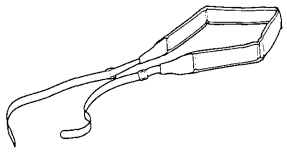
GPS determines latitude, longitude and altitude by defining the earth as an ellipsoid that revolves on its axis. This system is called the WGS84 (World Geodetic System 1984) coordinate system. Conventional maps and charts use different coordinate systems, depending on the location.

The unit calculates the latitude, longitude and altitude as determined by the WGS84 coordinate system, which uses a single coordinate system for the world. The unit displays the WGS84 coordinates by default. Therefore, the coordinates displayed by the unit may not be identical with those found in an atlas. You must set the appropriate Geodetic System in the Positioning Setting menu to have the unit display coordinates which correspond to the map or chart you may be using. Instructions for setting the unit – including selecting your Geodetic System – are discussed in Chapter 1.

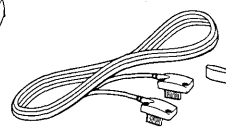
Unpacking the Unit

As you unpack the unit, check that the following items are included. If anything is missing, contact your nearest Sony dealer.

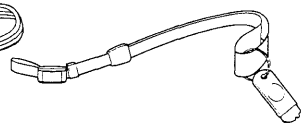
- Floating belt



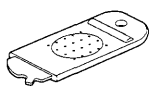
- Antenna extension cable (3 m or 10 ft length)



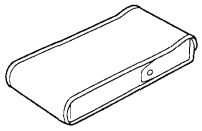
- Carrying strap



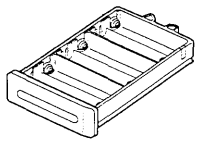
- Battery opener



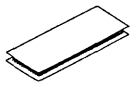
- Carrying case



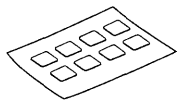
- Battery magazine



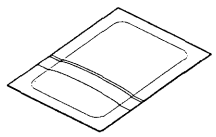
- Velcro tapes



- Two-sided adhesive tapes



- Contact cleaning tissue



Locating the Controls

This section explains the location and function of the parts and controls you use to operate the unit.

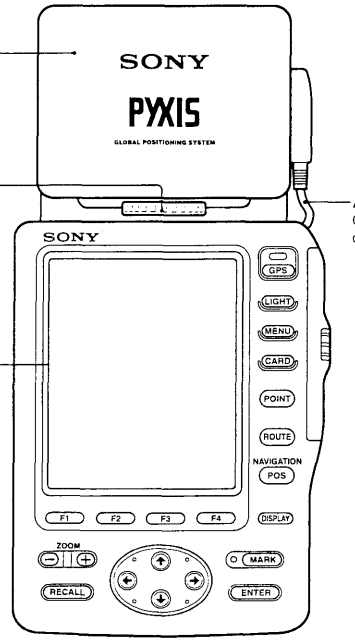
Main Unit

Front

Antenna
Receives and processes the radio signals from the GPS satellites. Adjust the antenna's angle to make the antenna horizontal toward the ground while using the unit.

Antenna holder
Holds the antenna and connects it to the display/keyboard unit. Adiusts the antenna's angle. To remove the antenna holder from the antenna and the display/keyboard unit, loosen the screws that hold both the antenna and the display/ keyboard unit.

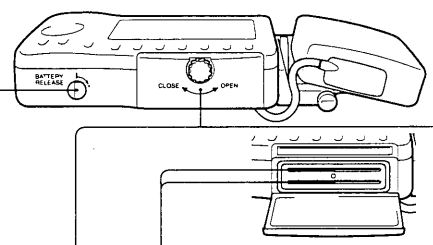
Liquid Crystal Display (LCD)
Displays the information received from the GPS satellites, IC memory cards, etc.



Antenna cable
Connects the antenna to the display/keyboard unit.

Locating the Controls

Right side



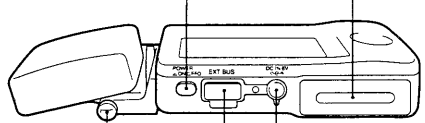
BATTERY RELEASE screw
Use this screw to remove the battery magazine from the unit. To remove the battery magazine, turn the screw in the direction of the arrow to the "." mark using the battery opener (supplied).

IC memory card slots
The slots hold the IC memory cards. You can use up to two cards at the same time. To insert a card, turn the screw toward "OPEN," then open the cover. When closing the cover, turn the screw toward "CLOSE." To remove the card from the slot, put the battery opener into the card's groove, then pull the card using the battery opener.

Left side

Battery magazine
Houses six R6 (size AA) alkaline batteries. To insert the battery magazine into the unit, push the battery magazine until the BATTERY RELEASE screw returns to center. To remove the battery magazine from the unit, turn the BATTERY RELEASE screw in the direction of the arrow to the "." mark.

POWER button
Turns the power on and off.

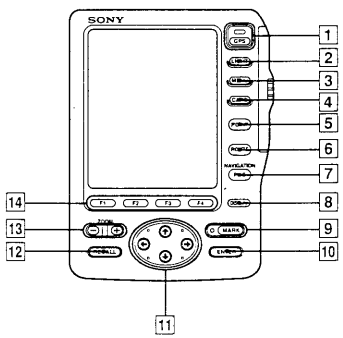


Antenna adjustment screw
Adjusts the antenna's angle. This screw is located at both sides. To loosen the screw, turn it counterclockwise. Turning the screw clockwise makes the antenna less movable.

EXT (External) BUS connector
Used for data communication between the unit and other equipment.

DC IN 6V jack
Connects to the DCC-E260L/HG car battery cord (not supplied).

Key Overview



[1] **GPS key**
Turns power to antenna on and off. To turn off the antenna, press and hold the GPS key for more than three seconds.

When the position update rate is set to Continuous, press this key to turn on the antenna (light is green). Press the key again to turn off the antenna (light is off).

When the position update rate is set to Interval, press this key to turn on the antenna at interval rate (light is red). Pressing the key again changes the position update rate to Continuous (light is green). Then press the key to turn off the antenna (light is off).

The key's light flashes green and red when you approach or reach your destination, or when you deviate from your course.

[2] **LIGHT key**
Turns the display's backlighting and the keys' lignt on and off.

[3] **MENU key**
Displays the menu screen (MENU mode). In this mode, you can make various system settings, display the satellite status and point memo, calculate the distance, and more.

[4] **CARD key**
Enters CARD mode. In this mode, you can operate IC memory cards. You can move data to and from cards, load data from the card, and more.

[5] **POINT key**
Enters POINT mode. In this mode, you can create, modify, delete, and search for navigation points.

[6] **ROUTE key**
Enters ROUTE mode. In this mode, you can create, modify, delete, and search for navigation routes.

[7] **POS key**
Enters POS (position) mode. In this mode, you can display your current position, navigate and display navigation information, record and display your course, and more.

[8] **DISPLAY key**
Changes the display to grid, text, and radar. You can also display a selection menu of stored point/route names when selecting points or routes.

[9] **MARK key**
Stores your current position in memory. When the key's light is on, this indicates that the unit can store your current position. When the key's light is off, this indicates that the unit cannot store your current position.

Note:
The MARK key automatically turns off when the GPS key is off. The key does not turn on unless the current position is acquired when the GPS key is turned on.

[10] **ENTER key**
Selects screen items, positions, and executes functions.

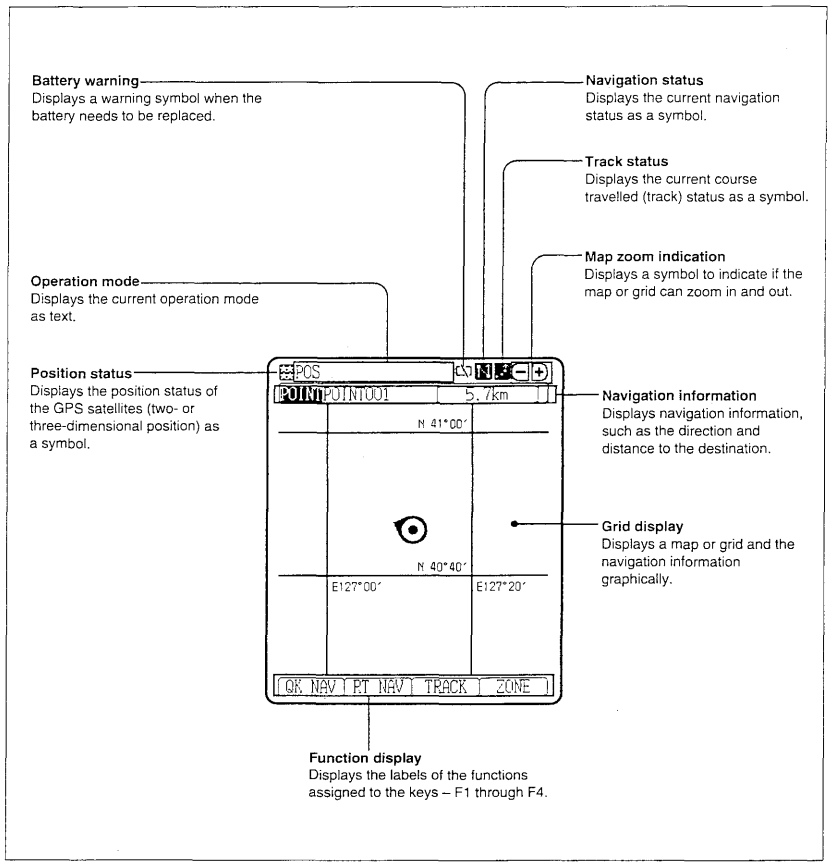
[11] **Directional cursor key**
Moves the cursor up, down, left, and right, to select screen items or position.

[12] **RECALL key**
Cancels an entry or selection, and returns to the previous display.

[13] **ZOOM (+/–) key**
Zooms in and out of maps and changes the scales of the latitude and longitude grid. Map zoom works only on map cards with variable scales.

[14] **Function keys**
The function of the keys – F1 through F4 – varies, depending on displayed screens.

Display Overview


Battery warning
Displays a warning symbol when the battery needs to be replaced.
Navigation status
Displays the current navigation status as a symbol.
Track status
Displays the current course travelled (track) status as a symbol.
Map zoom indication
Displays a symbol to indicate if the map or grid can zoom in and out.
Operation mode
Displays the current operation mode as text.
Position status
Displays the position status of the GPS satellites (two- or three-dimensional position) as a symbol.
POS
POINT
POINT001
5.7km
Navigation information
Displays navigation information, such as the direction and distance to the destination.
N 41°00′
N 40°40′
E127°00′
E127°20′
Grid display
Displays a map or grid and the navigation information graphically.
QK NAV
PT NAV
TRACK
ZONE
Function display
Displays the labels of the functions assigned to the keys – F1 through F4.

Precautions

To avoid possible malfunctions and to prolong the life of the unit:

- DO NOT IMMERSE IN WATER
  This product is not meant to be immersed in water or come in continuous contact with water. This product is designed to be waterproof. However, do not immerse it more than 1m (3 ft) in water.
- Do not expose the unit to excessive mechanical vibration or shock.
- Do not install the unit near strong magnets or speakers or in a dusty places.
- Do not expose the unit's LCD to:
  – Ambient temperature of more than 40 °C (104 °F) or less than 0 °C (32 °F). In very high ambient temperatures, the display may get darker. In very low ambient temperatures, the display changes slowly. (The display will return to normal under operating temperatures.)
  – High humidity. The LCD capability may deteriorate and a malfunction may occur.
- Do not put anything in the DC IN 6V jack except the recommended accessories.
- For car battery operation, use the car battery cord recommended for this unit.
- To protect the unit's memory, do not insert or remove the battery magazine or external power source, such as the car battery cord, during operation.

To maintain the unit:

- Clean the unit with a soft cloth. Do not use any type of solvent such as alcohol or benzene.
- Use a soft brush or cloth to wipe the rubber packing on the unit clean of any sand, dust, or water which degrade the unit's water resistance.
- If any solid object or liquid fall onto the unit, disconnect the power source and have the unit checked by a Sony dealer or any Sony Service Center.

Chapter 1:
Setting Up the Unit

Setting Up

Overview

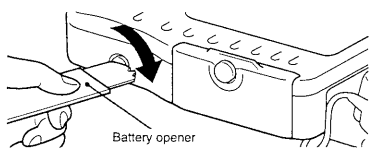
Follow these steps to set up the unit. The details of each step are on the page shown in parentheses.

1 Install the batteries (page 14)
2 Power on the unit (page 16)
3 Make the initial settings (page 16)
4 Attach the carrying strap (page 19)
5 Install the antenna (page 20)

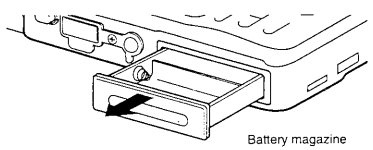
Step 1: Install the Batteries

You need six R6 (size AA) alkaline batteries. To install the alkaline batteries:

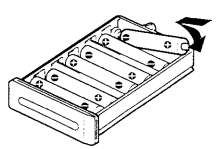
1 **Using the supplied battery opener, turn the BATTERY RELEASE screw in the direction of the arrow to the "." mark until the battery magazine pops out.**



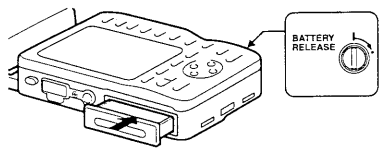
2 **Remove the battery magazine from the unit.**



3 **Insert the six R6 (size AA) alkaline batteries (not supplied), using the illustration inside the battery magazine as a guide to the correct orientation of the batteries.**



4 **Insert the battery magazine until the BATTERY RELEASE screw returns center.**



Battery operation time

The unit can operate continuously for about four hours on six R6 (size AA) alkaline batteries and two hours when using the display's backlight. When the position update rate is set to interval in the Positioning Setting menu, the unit can operate for about ten hours on alkaline batteries (see page 70).

Replacing batteries

When the batteries are discharged, the symbol "⏀" (battery warning display) and the message "Warning! Battery low" appear in the display. When these appear, have new alkaline batteries ready for replacement. If the batteries are completely discharged, the message "Battery empty! Turn off power and replace battery" appears, and the unit automatically shuts off in a few seconds.

Note:
Use alkaline batteries: non-alkaline batteries will not last as long.

Extending the battery life

Certain functions, such as backlighting and beeps, cause the batteries to discharge faster. To extend the battery life, keep the use of these functions to a minimum.

Note:
Sometimes, using one of these functions may cause a temporary drop in voltage and the message "Warning! Battery low" may be displayed. However, the voltage is probably sufficient for normal operation.

About the lithium batteries

The unit has two built-in lithium batteries. One battery supplies power for memory, which stores navigation points and routes. The other battery supplies power for the antenna, which stores the satellite information. These lithium batteries last about five years. When they are discharged, the message "Internal lithium battery low" appears. In this case, have the batteries replaced by a Sony dealer or any Sony Service Center.

Note:
When you have the lithium batteries replaced, the unit will take about 20 minutes (or more than one hour depending on the reception condition) to acquire the current position in order to receive the orbital information for all satellites.

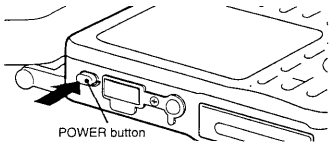
Using other power sources

You can also power the unit using the following optional accessories:
• Rechargeable battery pack (not supplied)
• Car battery, using an optional Sony adaptor
For details on these power sources, see "Using Optional Accessories" on page 77.

Setting Up

Step 2: Power On the Unit

To power on the unit, press the POWER button. The unit turns on and the title screen appears.



To power off the unit, press the POWER button.
Once you have acquired your current position, the last screen displayed in POS mode appears the next time you power on the unit.

To use the display's backlight, press the LIGHT key. To turn off the backlight, press the key again. To conserve the batteries, use the backlight to a minimum.

Step 3: Make Initial Settings

To make the initial settings:

1 Select the language (page 16)
2 Specify your geographic location (page 17)
3 Select the time difference between local time and UTC (Universal Time Coordinated) (page 17)
4 Select the Geodetic System (page 18)

Step 3A: Select the language

When you are using the unit for the first time, a list of languages appears. The default setting is "English."

From the list of languages, choose the language you want to use with the ↑ ↓ key, then press the ENTER key.

Step 3B: Specify your geographic location

The default setting is latitude 0 degree and longitude 0 degree.

Specify your geographic location with the □ cursor using the directional cursor key, then press the ENTER key.

Notes:
- When the unit receives the GPS satellites before setting your current position, the received position is automatically set to your current position.
- If your current setting deviates from the specified position more than 2,000 km (1,250 miles), it make take approximately 20 minutes to receive the GPS satellites.

Step 3C: Select the time difference

GPS employs UTC time. To set the time display to local time, you have to set the time difference between local time and UTC time. The default setting is "0:00." The time difference chart is provided on page 81, including names of countries and cities.

To set the time difference, adjust the time difference between local time and UTC time using the ← → key, then press the ENTER key.

You can set the time difference by 15 minutes interval.

When your local time uses Daylight Saving Time, press the F1 key (DST) before pressing the ENTER key.

Step 3D: Select the Geodetic System

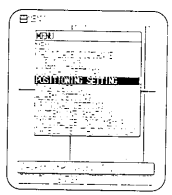
You must set the appropriate Geodetic System so the unit can display coordinates that correspond to the map or chart you may be using. The default setting is "WGS 84." A list of the available Geodetic Systems is provided on page 82.

To select your Geodetic System:

1 **Press the MENU key.**

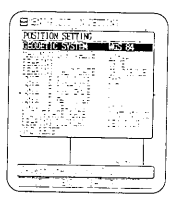
The menu appears.

2 **Choose POSITIONING SETTING from the menu using the directional cursor key, then press the ENTER key.**



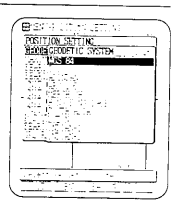
The Positioning Setting menu appears.

3 **Choose GEODETIC SYSTEM from the Positioning Setting menu using the directional cursor key, then press the ENTER key.**



A list of the Geodetic Systems appears.

4 **Choose the Geodetic System from the list using the directional cursor key, then press the ENTER key.**



After you have set up the unit as described in this chapter, you are ready to begin using the unit. Chapter 2, "Getting Started With the Unit," describes how to get started using the IPS-760. Chapter 3, "Customizing the Unit," describes how to change the unit's default setting to suit your individual needs.

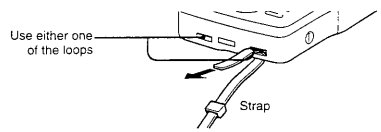
Note:
When you use a commercially available map card or point database card, the Geodetic System is set to the one employed on the card.

Step 4: Attach the Carrying Strap

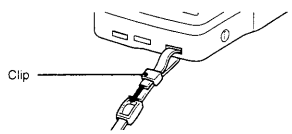
(You can skip this step if you do not want to attacxh the carrying strap.) The bottom of the unit has two loops for attaching the carrying strap (supplied). When carrying the unit, place the carrying strap around your hand to prevent accidentally dropping the unit.

To attach the carrying strap:

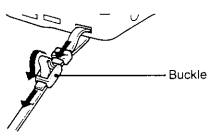
1 **Thread the strap through the loop on the bottom of the unit.**



2 **Thread the strap back through the clip.**

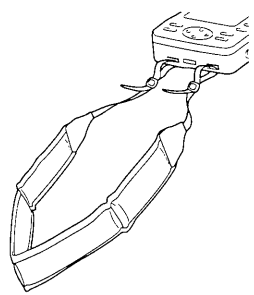


3 **Thread the end of the strap through the buckle, then pull the strap tight.**



Using the carrying case
You can keep the carrying strap in the carrying case (supplied). To use the carrying case with the strap, attach the strap to the unit first, then insert the unit into the case.

Attaching the floating belt
When using the unit at sea or on river, we recommend you to attach the floaitng belt (supplied) instead of the carrying strap to float the unit. Before attaching the belt, thread the spare battery opener (supplied). You can also use the belt as the shoulder belt.



Floating belt

Step 5: Install the Antenna

This section explains how to remotely install the antenna on your boat, car roof, or wherever you plan on using the unit.

The antenna is detachable from the unit, so you can install the antenna and the keyboard unit separately. Using the antenna extension cable (supplied), you can place the antenna up to three meters (ten feet) from the unit.

To install the antenna and display/keyboard unit:

1 Determine the location for the antenna (page 20)
2 Disconnect the antenna from the unit (page 20)
3 Replace the antenna cable with the antenna extension cable (page 21)
4 Install the antenna remotely (page 22)

To help install the antenna and the display/keyboard unit, several optional accessories are available, such as the MAK-IPS76 mount kit and the EXC-IPS7 antenna extension cable (7 m or 23 ft length).

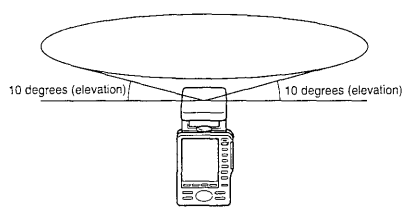
Note:
Turn off the unit before installation.

Note:
The unit uses an integrated antenna and receiver, which cannot be substituted with antennas or cables from the Sony IPS-360 or other manufacturers.

Step 5A: Determine the location for the antenna

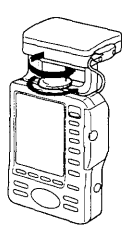
To ensure the best possible satellite reception, position the antenna horizontally, with no line-of-sight obstructions (see the figure below). The fewer obstructions, the better the unit can receive the satellite signals.

Note:
You cannot receive the GPS satellite signals indoors.



Step 5B: Disconnect the antenna

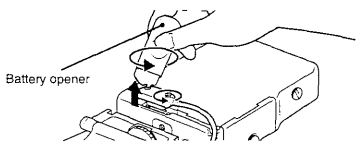
To disconnect the antenna from the unit, loosen the screw first, then remove the antenna.



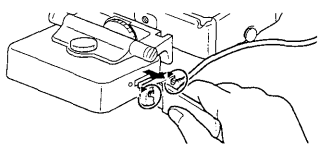
Step 5C: Replace the antenna cable

To replace the antenna cable with the antenna extension cable (supplied):

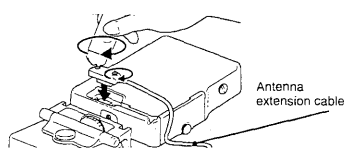
1 **Loosen the display/keyboard-side connector using the battery opener (supplied), then remove the cable.**



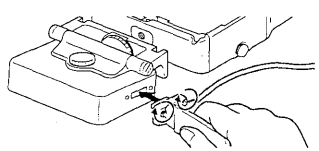
2 **Loosen the antenna-side connector using the battery opener, then remove the cable.**



3 **Connect the antenna extension cable to the antenna-side connector, then tighten the screw using the battery opener.**



4 **Connect the other end of the antenna extension cable to the display/keyboard-side connector, then tighten the screw using the battery opener.**

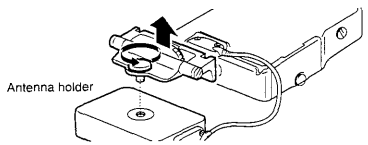


Notes:
- Make sure the antenna cable is firmly connected to the display/keyboard and to the antenna. Make sure the cable is properly seated in the grommet to preserve the water-resistance of the unit.
- If you turn on the unit and the antenna is disconnected, the message "Antenna disconnected" is displayed. When displaying your current position or navigating, check connection of the antenna cable, then press the GPS key to turn on the antenna.

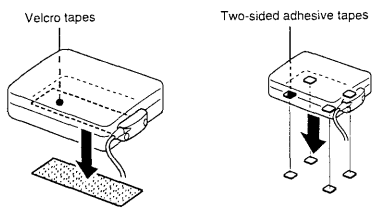
Step 5D: Install the antenna remotely

To install the antenna remotely:

1 **Loosen the screw, then remove the antenna holder from the rear of the antenna.**



2 **Attach the velcro tapes (supplied) or two-sided adhesive tapes (supplied) to the surface of the installation location and the rear of the antenna.**



Use the velcro tapes when you want to make the antenna detachable from the surface of the installation location. Use the two-sided adhesive tapes for a more permanent installation.

Notes:
- To use the tapes in the optimum condition, leave the antenna for more than 24 hours before starting to use the unit.
- When removing the antenna, detach the tapes slowly.

Operation Mode Overview

The following table is an overview of the operation modes of the unit. The details of each procedure are on the page shown in parentheses.

Mode	Descripotion	Function
POS	POS mode provides information on your current position, navigates from your current position to your destination, records tracks, and specifies zone.	• Displaying Your Current Position (page 27) • Navigating to Your Destination (page 39) • Route Navigation (page 43) • Recording Tracks (page 46) • Displaying Tracks (page 48) • Searching for Tracks (page 49) • Modifying Track Names (page 50) • Deleting Tracks (page 50) • Setting Zones (page 51) • Displaying Zones (page 52) • Releasing Zones (page 53)
POINT	POINT mode manipulates navigation points: create, modify, delete, and search for navigation points.	• Creating New Points (page 31) • Searching for Points (page 33) • Modifying Points (page 34) • Deleting Points (page 34)
ROUTE	ROUTE mode manipulates navigation routes: create, modify, delete, and search for navigation routes.	• Creating New Routes (page 35) • Searching for Routes (page 37) • Modifying Routes (page 38) • Deleting Routes (page 38)
MARK	MARK mode stores the current position in memory.	• Storing Your Current Position (page 30)
CARD	CARD mode manipulates the IC memory card operation, such as storing data into the card and copying the card's data to the unit.	• Displaying the Card Information (page 62) • Storing Data onto Cards (page 63) • Loading Data from Cards (page 64) • Copying Data from a Card to Another Card (page 65) • Initializing Cards (page 66) • Using Applications (page 67)
MENU	MENU mode displays the menu screen to make various system settings, display the satellite status and memo, calculate the distance, etc.	• Measuring Your Course Length (page 54) • Displaying a Point Memo (page 55) • Displaying the World Clock (page 56) • Displaying the System Information (page 57) • Initializing the Unit's Memory (page 58) • Displaying the Satellite Status (page 59) • Setting the Display (page 68) • Setting the Positioning Conditions (page 70) • Setting the Clock (page 72) • Setting the Alarms (page 73) • Changing the System Settings (page 76)

Using the Display and Keys

This section describes basic techniques for using the IPS-760's display and keys.

The functions and commands of the IPS-760 are organized into the various menu screens and function keys. Following the guidance messages that appear on the display, use the menu screens or function keys to operate the unit.

The methods for specifying positions and entering letters and numbers are also described here.

Selecting

To execute a function or command, you select it from the display. To select, press the directional cursor key until your selection is highlighted, then press the ENTER key.

Using Menus

Use the menu screens to select menu items.

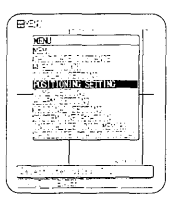
To	Press
Choose an item	↑ ↓ key
Enter the item	ENTER key
Cancel the menu screen	RECALL key
Turn to the next page	→ key
Turn to the previous page	← key

In this manual, the word "choose" means to highlight an item using the directional cursor key, and then press the ENTER key to enter the selection.
For example, "choose Positioning Setting from the menu" means "choose Positioning Setting from the menu using the directional cursor key, then press the ENTER key."

Using Function Keys

When descriptions of the function keys are shown at the bottom of the screen, this indicates that the key is "active" and that you can use it. Each function may vary depending on the screens.

To cancel the current function, press the F1 key (QUIT).



Note:
The function key labelled "ENTER" works the same as the ENTER key.

Specifying Positions

When creating navigation points and routes, and specifying destination points, you must specify positions.

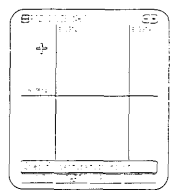
You can specify positions using any of the following methods:
- Specifying a point on the map using the + cursor
- Selecting a point that is already stored in the unit or the IC memory card from the point list
- Entering a point's latitude and longitude data

Instructions for each method follow.

Specifying a point using the + cursor

To specify a point on the grid using the + cursor, move the + cursor to your desired position using the directional cursor key, then press the ENTER key.

The grid display scrolls when the + cursor reaches the end of the display.



When you specified a point in the area where the points are crowded, select the point from the point list.

Note:
When you use a map card or commercially available point database card, the Geodetic System is set to the one employed on the card.

Selecting a stored point from the point list

To display the point list, press the DISPLAY key. Pressing the DISPLAY key again returns to the grid display.

To select a stored point from the point list, select the desired point using the directional cursor key, then press the ENTER key.

To	Press
Choose a point	↑ ↓ key
Enter the selection	ENTER key
Cancel the point list	RECALL key

Notes:
- You can also select a stored route from the route list and a stored track from the track list using this method.
- When a point's Geodetic System is different from the one by the unit, the point is shown on tinted background.

When you want to see the point list in which only the points in the displayed area are included, press the F3 key (IN AREA). To display the point list in which all the points are included, press the F3 key (ALL) again.

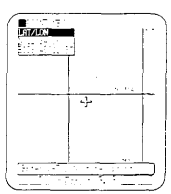
Entering latitude and longitude data

To start entering a point's latitude and longitude data, press the F3 key (LAT/LON). Pressing the F3 key (+CURSOR) again returns to the grid display.

To select the position or digit to enter data, move the cursor using the ← → key.

To enter data, select numbers using the ↑ ↓ key.

When you have finished entering data, press the ENTER key or press the F2 key (ENTER).



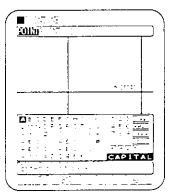
To change the direction of latitude to north (N) or south (S) or longitude to east (E) or west (W):
1 Move the cursor to N (S) or E (W) using the ← → key.
2 Change the character to the desired direction using the ↑ ↓ key.

Note:
You can also enter the magnetic variation in the Positioning Setting menu and distances in the Alarm Setting menu using this method.

Entering Letters and Numbers

You can enter names and memos for the data you stored in the unit or IC memory card.

To enter names and memos, use the table of keys.



To enter names for tracks and points stored with the MARK key, press the F4 key (INPUT) to display the table of keys.
When entering names for new points and routes and point memo, the table of keys automatically appears.

When creating a point or route, recording a track, or storing a current position, a temporary name, such as "POINT 001," is automatically assigned. To enter a new name, first select "Clear" from the table, then press the ENTER key. The temporary name is deleted.

To enter letters and numbers, select the character from the table using the directional cursor key, then press the ENTER key.

To move the position to enter letters or numbers, move the cursor by selecting the directional arrows from the table, then press the ENTER key.

To change the characters of the table to lowercase or uppercase, press the F4 key (CAPS) to change the mode between "CAPITAL" and "SMALL."

When you have finished entering letters or numbers, press the F2 key (END).

To cancel entering names or memos, press the F1 key (QUIT).

Notes:
- When entering memos, you can change paragraphs by selecting "Return" from the table, then press the ENTER key.
- You can enter up to 24 characters for a point/route/track name and up to 255 characters for a point memo.

Determining Your Current Position

When you power on, the unit automatically acquires your current position. You can store this position in memory.

Displaying Your Current Position

To display your current position, press the POS key.

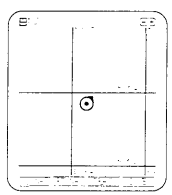
The unit enters POS mode, which lets you display your current position, including latitude, longitude, and altitude.

You can display your current position in three ways:Grid, Text, and Radar.

To change the display, press the DISPLAY key.

Note:
Due to the GPS specifications, the accuracy of track course and velocity gets low if your velocity is less than 10 km/h (6 mph of 5.4 knots). Therefore, to ensure safety, the unit does not display track course and velocity when your velocity is less than 10 km/h.

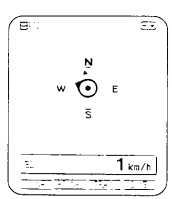
- **Grid display:** Displays a grid (when an IC memory card storing map data is inserted, a map is displayed instead). The current position is centered on the grid.



Note:
Because the unit employs the equidistant cylindrical projection, some deformation of shape towards the poles can be seen in the grid display. When the latitude is more than 70 degrees North or South, the grid display is not used due to the considerable deformation of shape.

- **Text display:** Displays your current position's data, including latitude, longitude, and altitude.

- **Radar display:** Displays direction to the destination and track course in a radar chart while navigating to the destination.



Determining Your Current Position

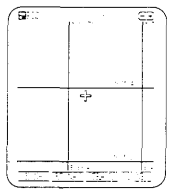
Scrolling the grid

To scroll the grid:

1 **Press the directional cursor key.**

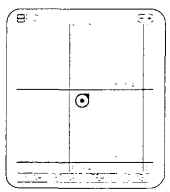
The + cursor appears.

2 **Move the + cursor in the direction you want to scroll the map using the directional cursor key.**



When the + cursor reaches the end of the screen, the map scrolls in the direction of the + cursor.

To return the screen to your current position after scrolling, press the POS key.



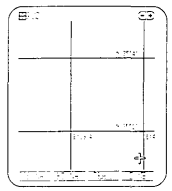
The symbol for displaying your current position changes from the + cursor to the current position mark.

Zooming in/out

You can change the scale of the grid by zooming in and out of the display. Map zoom works only on map cards with variable scales.

To zoom in, press the ZOOM (+) key.

To zoom out, press the ZOOM (–) key.



Scales of the latitude/longitude grid are as follows:

Scale	Grid interval
1/50000	1 minute
1/200000	4 minutes
1/500000	10 minutes
1/1000000	20 minutes
1/3000000	1 degree

If you cannot acquire your current position

Check the following:
- The GPS key is turned on (the GPS key is lit) (see page 11).
- The antenna is in a location with no obstructions (see page 20).

You can also display the satellite status to check the satellite allocation (see page 59).

Determining Your Current Position

Storing Your Current Position

You can store your current position, such as latitude and longitude, at any time the unit is acquiring signals from the satellites, regardless of which mode the unit is in. This data is stored in memory as a point, which you can use for navigation.

To store your current position:

Note:
To store your current position, the unit must first have a current position calculated (that is, it must be receiving GPS signals from at least three satellites).

1 **Press the MARK key.**

The unit stores your current position, and assigns a temporary name for that point, such as "MARK001." To use the temporary name, press the ENTER key (you do not have to perform steps 2 through 4). The screen that was displayed before pressing the MARK key appears. To change the temporary name, go to step 2.

2 **Press the F4 key (INPUT) to enter the point name.**

3 **Enter the point name.**

Note:
To enter letters and numbers, refer to "Entering Letters and Numbers" on page 26.

4 **Select the point icon.**
To display the next page of the point icon menu, press the F4 key (CHANGE).

To cancel storing your current position, press the F1 key (QUIT).

Note:
You cannot store your current position if:
- The GPS key is turned off.
- The position is not updated for more than 20 seconds.
- The position update rate is set to Interval.

To change the temporary name of a stored point, modify the point name in POINT mode. See "Modifying Points" on page 34.

You can also enter additional data about the point, such as the point type. You can also create notes about a point. See "Modifying Points" on page 34.

If you cannot store your current position

Check the following:
- The GPS key is turned on (the GPS key is lit) (see page 11).
- The position update rate is set to Continuous in the Positioning Setting menu (see page 70).

Creating Navigation Points

This section explains how to create and edit navigation points.

You can save position information for navigation using several methods: specifying the position on the map, inputting the latitude and longitude data, or by just storing your current position. This position information is known as a "navigation point" or, more simply, a "point."

In POINT mode, you can create, modify, delete, and search for points.

To enter POINT mode, press the POINT key.

Note:
Before selecting the function in POINT mode, you can display the point memo by selecting the point name and pressing the ENTER key in the point list.

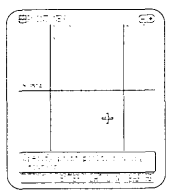
Creating New Points

When you create a new point, you can assign names and icons to each point so you can easily indentify that point when navigating.

To create a new point:

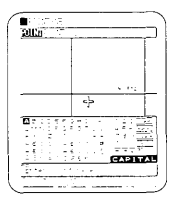
1 **Press the F1 key (NEW).**

2 **Specify the position.**



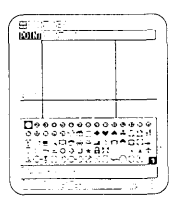
Note:
To specify a point, refer to "Specifying Positions" on page 25.

3 **Enter the point name.**



Note:
To enter letters and numbers, refer to "Entering Letters and Numbers" on page 26.

4 **Select an icon for the point.**
To display the next page of the point icon menu, press the F4 key (CHANGE).



To cancel creating a new point, press the F1 key (QUIT).

Entering the point type and memo

You can also enter additional data about the point, such as the point type. You can also create notes about a point. See "Modifying Points" on page 34.

If the memory is full

When you create a point, the point's data is stored in memory – in the unit's memory or in the IC card's memory – whichever device you have specified. If the message "Insufficient memory" appears, this indicates that the device's memory is full, which means that you will not be able to save the point until additional memory is made available. To make more memory available for the point, first check the unit's memory by choosing System Information from the menu. Then either delete any unneeded data (points, routes, etc.) from memory, or move data from the unit's memory to an IC card's memory. To delete data from the unit, see "Deleting Points" on page 34, "Deleting Routes" on page 38, "Deleting Tracks" on page 50, and "Releasing Zones" on page 53. For more information on using IC memory cards, see "Using IC Memory Cards" on page 60.

Note:
When storing data onto an IC memory card, choose the appropriate card from the Memory Device option in the Original Setting menu.

Searching for Points

The following search methods are available to search for points. You can assign multiple methods.

Memory: Selects the memory device in which a point to be searched for is stored.

Type: Searches for a point by the point type. A table of the available point types is provided on page 84.

Icon: Searches for a point by the point icon.

Text: Searches for a point by the point name that begins with the assigned text.

Criteria: Releases all the search criteria that are currently assigned.

To search for a point:

1 **Press the F4 key (SEARCHP).**

2 **Select the search method.**

3 **Select the search item.**

To cancel searching for a point, press the F1 key (QUIT).

To release the current search criteria:
1 Preses the F4 key (SEARCHP).
2 Choose DELETE CRITERIA from the Search menu.
3 Choose YES to release the criteria.

Note:
You can only set one item for each search method.

Modifying Points

You can modify names, icons, and the position of points. You can also enter additional data about the point, such as the point type, and notes about the point.

To modify a point:

1 **Press the F2 key (MODIFY).**

2 **Specify the point to modify.**

3 **Select the item to modify.**

4 **Modify the selected item.**

Certain point types are classified into one or two detailed categories. If you want to stop selecting the categories, press the F2 key (FNL ENT). A table of the available point types is provided on page 84.

To cancel modifying the point, press the F1 key (QUIT).

Note:
When you modify the position of a point that is used in a route, a new point is created in the modified position, and all the data are transferred to the new point. Therefore, you do not have to modify the route.

Deleting Points

To delete a point:

1 **Press the F3 key (DELETE).**

2 **Specify the point to delete.**

3 **Choose YES to delete the selected point.**

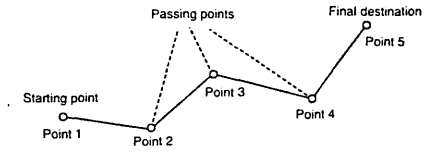
To cancel deleting a point, press the F1 key (QUIT) or choose NO in step 3.

Note:
You cannot delete points that are used in a route. First modify or delete the route and then delete the point from the route.

Creating Navigation Routes

This section explains how to create and edit navigation routes.

To create a route, you must combine the navigation points that you have already stored in the unit or the IC memory cards. First plan your route from the starting point, followed by the passing points and the final destination (see the figure below).



In ROUTE mode, you can create, modify, delete, and search for routes.

To enter ROUTE mode, press the ROUTE key.

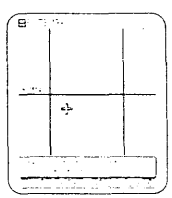
Creating New Routes

You can create new navigation routes. When you create a route, you can assign it a route name. A route can hold up to 99 navigation points.

To create a new route:

1 **Press the F1 key (NEW).**

2 **Specify the starting point.**

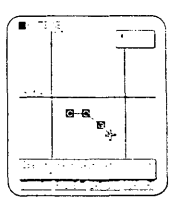


Note:
To specify a point, refer to "Specifying Positions" on page 25.

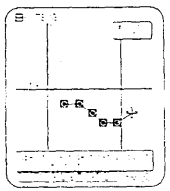
3 **Specify the passing points consecutively. Finally specify the destination point.**

The number of points in the route is displayed on the screen.

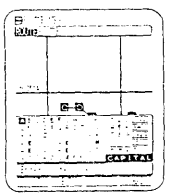
To continue specifying the next point, press the ENTER key.
To specify the previous point, press the RECALL key.



4 **After specifying the destination point, press the F2 key (FNL ENT).**



5 **Enter a name for the route.**



Note:
To enter letters and numbers, refer to "Entering Letters and Numbers" on page 25.

To cancel creating a new route, press the F1 key (QUIT).

If the memory is full

When you create a route, the route's data is stored in memory – in the unit's memory or in the IC card's memory – whichever device you have specified. If the message "Insufficient memory" appears, this indicates that the device's memory is full, which means that you will not be able to save the route until additional memory is made available. To make more memory available for the route, first check the unit's memory by choosing System Information from the menu. Then either delete any unneeded data (points, routes, etc.) from memory, or move data from the unit's memory to an IC card's memory. To delete data from the unit, see "Deleting Points" on page 34, "Deleting Routes" on page 38, "Deleting Tracks" on page 50, and "Releasing Zones" on page 53. For more information on using IC memory cards, see "Using IC Memory Cards" on page 60.

Note:
When storing data onto an IC memory card, choose the appropriate card from the Memory Device option in the Original menu.

Searching for Routes

The following search methods are available to search for routes. You can assign multiple methods.

Memory: Selects the memory device in which a route to be searched for is stored.

Text: Searches for a route by the route name that begins with the assigned text.

Criteria: Releases all the search criteria that are currently assigned.

To search for a route:

1 **Press the F4 key (SEARCHR).**

2 **Select the search method.**

3 **Select the search item.**

To cancel searching for a route, press the F1 key (QUIT).

To release the current search criteria:
1 Press the F4 key (SEARCHR).
2 Choose DELETE CRITERIA from the Search menu.
3 Choose YES to release the criteria.

Note:
You can only set one item for each search method

Modifying Routes

You can add, move, insert, and delete points in a route, and modify route names.

To modify a route:

1 **Press the F2 key (MODIFY).**

2 **Select the route to modify.**

3 **Choose YES to modify the selected route.**

4 Select the item to modify.

5 Modify the selected item.
To add a point: specify the point to be added to the route.

To move a point:
1 Specify the point to be moved using the + cursor or from the point list.
2 Specify the new position using the + cursor or enter the latitude and longitude data of the new position.

To insert a point:
1 Decide two points in the route between which you want to insert a new point. The cursor to specify the position to insert the point moves among the points in the route. Specify the position using the cursor.
2 Specify the point to be inserted.

To delete a point, specify the point to be deleted from the route.
In the grid display, the cursor to specify the deletion of the point moves among the points in the route. Specify the point using the cursor.
In the point list, select the point from the list.

To cancel modifying a route, press the F1 key (QUIT).

Deleting Routes

To delete a route:

1 **Press the F3 key (DELETE).**

2 **Select the route name to delete.**

3 **Choose YES to delete the selected route.**

To cancel deleting a route, press the F1 key (QUIT) or choose NO in step 3.

Navigating to Your Destination

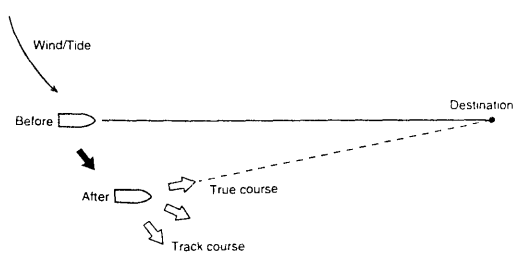
You can navigate from your current position to a destination point that you specify in POS mode. This navigation, called "Quick Navigation," is useful for navigating to short distances.

Navigation information

During Quick Navigation, the unit provides the following information:
- Track course
- True course
- Distance from your current position to your destination
- Velocity
- Cross track error (course deviation indicator)
- Estimated time of arrival or estimated time enroute
- WGS84 altitude (the altitude based on the World Geodetic System 1984 coordinates)
- Latitude
- Longitude
- Destination name

Track course and true course

The unit calculates the track course and true course according to the concept illustrated below.



Unlike your compass heading, track course indicates course deviations that are caused by factors such as wind, tide, and so on.

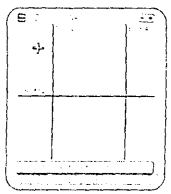
Starting Navigation

To start Quick Navigation:

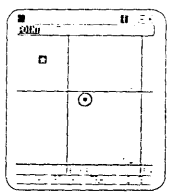
1 **Press the POS key to enter POS mode.**

2 **Press the F1 key (QK NAV).**

3 **Specify your destination point.**
To move the + cursor to your current position, press the F3 key (POS).



4 **Press the ENTER or F2 key (START) to begin navigation.**
Navigation begins. The destination point you have specified is shown as the "★" mark on the grid display.



To stop navigation:
1 Press the F1 key (QK NAV).
2 Press the F1 key (QUIT).

Notes:
- Before starting navigation, make sure the latitude and longitude data is acquired.
- The unit does not store the destination point that is specified using the + cursor during Quick Navigation.

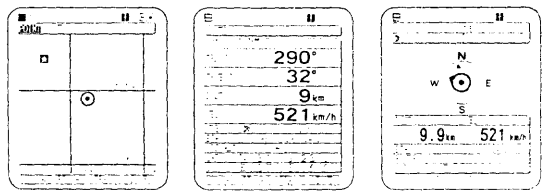
Note:
To specify your a point, refer to "Specifying Positions" on page 25.

Displaying Navigation Information

You can display navigation information in the grid, text, or radar display, including the cross track error display.

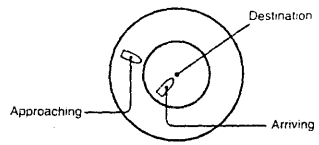
To change the display, press the DISPLAY key.

• Grid display • Text display • Radar display



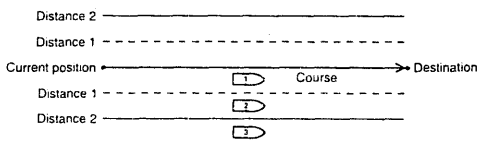
When you approach or reach your destination

The unit notifies you with an alarm and the GPS key's light flashes green and red when you approach or reach your destination.



If you deviate from your course

The unit notifies you with an alarm and the course deviation indicator. The GPS key's light flashes green and red if you deviate from your course. This indicator gives you information about the direction you are travelling in (track course) versus the direction to your destination (true course) so that you can check if you are heading in the right direction. This information is called "cross track error".



Check how far and which direction you deviate from your course with the following indicator:

Indicator	Meaning
1 ≪	Within the acceptable range of the course deviation (less than Distance 1)
2 ≪≪	Watch for the course deviation (greater than Distance 1 but less than Distance 2)
3 ≪≪≪	Warning! (greater than Distance 2)

Note:
The direction of the cross track error display's arrow shows the direction of the course correction.

About the alarms

During navigation, you can use the following alarms:
- Destination alarm: Notifies you when approaching or reaching your destination.
- Course deviation alarm: Notifies you when deviating from your course.
- Zone alarm: Notifies you when entering a particular zone you have specified. If you want to use the zone alarm, specify the zone before you start navigation (see "Specifying Zones" on page 51).

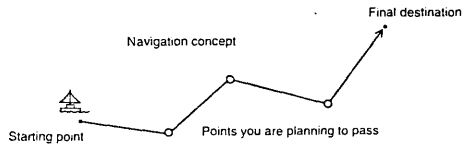
If you want to turn on/off the alarms or change the alarm settings, make the settings before you start to navigate. See "Setting the Alarms" on page 73.

Note:
When the position update rate is set to Interval in the Positioning Setting menu, the alarms may not function or the cross track error may not be displayed.

Route Navigation

This section explains how to plan a route and navigate to your destination using that route.

The unit can navigate to a destination via your planned route. To plan a route, you need to determine your starting point, the points you are planning to pass, and the final destination (see the figure below). This navigation is called "Route Navigation." Route Navigation is useful when travelling a long distance or a complicated route.



Navigation information

During navigation, the unit displays the following information:
- Track course
- True course (direction from your current position to the passing point or final destination)
- Distance between your current position and the passing point or final destination
- Velocity
- Cross track error display (course deviation indicator)
- Estimated time of arrival or estimated time enroute
- WGS84 altitude (the altitude based on the World Geodetic System 1984 coordinates)
- Latitude
- Longitude
- Route name
- Name of the passing point

Planning Your Route

Plan your route before you start navigation.

To plan your route:

1 **Decide the destination and route using a chart, map, or map information stored on an IC memory card.**

2 **Store the latitude and longitude data for the destination point and the points you are planning to pass in the route.**
→ "Creating Navigation Points" (see page 31)
→ "Storing Your Current Position" (see page 30)

3 **Create your route in ROUTE mode using the stored navigation points.**
→ "Creating Navigation Routes" (see page 35)

When you have finished planning and creating your route, you are ready to start navigation.

Starting Navigation

You must have at least one route created to start Route Navigation. The unit navigates from your current position to your destination.

To start navigation:

1 **Press the POS key to enter POS mode.**

2 **Press the F2 key (RT NAV).**

3 **Select the route name.**

4 **Select your starting point of navigation from the navigation points in the selected route.**

5 **Press the ENTER or F2 key (START) to begin navigation.**

To stop navigation:
1 Press the F2 key (RT NAV).
2 Press the F1 key (QUIT).

Notes:
- Before starting navigation, make sure the latitude and longitude data is acquired.
- When you modify the navigation points in the route during navigation, the contents of the route are automatically updated.
- You cannot change the route during navigation.

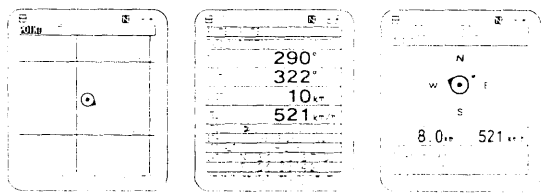
If you want to change the direction of the route for round trip, press the F3 key (REVERSE).

Displaying Navigation Information

You can display navigation information in the form of a grid, text, or radar display, including the cross track error display.

To change the display, press the DISPLAY key.

• Grid display • Text display • Radar display



When you approach or reach your destination

The unit notifies you with an alarm and the GPS key's light flashes green and red when you approach or reach your destination.

If you deviate from your course

The unit notifies you with an alarm and the course deviation indicator. The GPS key's light flashes green and red if you deviate from your course. The indicator gives you the information of the direction you are travelling in (track course) versus the direction to your destination (true course) so that you can check if you are heading in the right direction. This information is called "cross track error."

Check how far and which direction you deviate from your course with the indicator (see table on the right).

Indicator	Meaning
≪	Within the acceptable range of the course deviation (less than Distance 1)
≪≪	Watch for the course deviation (greater than Distance 1 but less than Distance 2)
≪≪≪	Warning! (greater than Distance 2)

About the alarms

During navigation, you can use the following alarms:
- Destination alarm: Notifies you when approaching or reaching your destination.
- Course deviation alarm: Notifies you when deviating from your course.
- Zone alarm: Notifies you when entering a particular zone you have specified. If you want to use the zone alarm, specify the zone before you start navigation (see "Specifying Zones" on page 51).

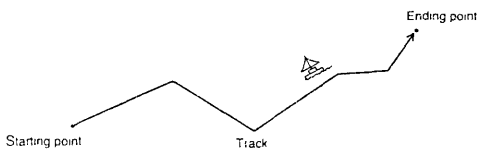
If you want to turn on/off the alarms or change the alarm settings, make the settings before starting navigation. See "Setting the Alarms" on page 73.

Notes:
- The direction of the cross track error display's arrow shows the direction of the course correction.
- When the position update rate is set to Interval in the Positioning Setting menu, the alarms may not function or the cross track error may not be displayed.

Tracking Your Course

This section explains how to track your course travelled.

You can record and display a graphic representation and information about your trip from your starting point to your current position. The course travelled in your trip is called "track" (see figure below).



The unit provides the following information
- Total distance from the starting point to your current position
- Direction from the starting point to your current position
- WGS84 altitude (this is the altitude based on the World Geodetic System 1984 coordinates)

In POS mode, you can track your course travelled, display and delete the track, and also modify and search for track names.

To enter POS mode, press the POS key.

Recording Tracks

To record a track:

1 **Press the F3 key (TRACK).**

2 **Choose START RECORDING from the Track menu.**

3 **Press the ENTER or F2 key (START) to start recording a track.**
The unit assigns a temporary name for the track, such as " TRACK001."
When you want to enter a track name before starting to record a track, press the F4 key (INPUT) in step 3.
Recording begins.

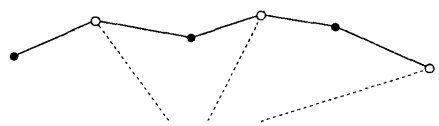
To stop recording the track:
1 Press the F3 key (TRACK).
2 Choose QUIT RECORDING from the Track menu.
3 Choose YES to stop recording the track.

Note:
Before recording a track, make sure the latitude and longitude data is acquired.

Note:
To enter letters and numbers, refer to "Entering Letters Numbers" on page 26.

If the track is full

The unit records a point in every 50 meters of the course travelled or in every three seconds. If the number of points in the track exceeds 500, the message "Track full. Point interval is being modified in order to continue tracking" appears. When you want to continue recording the track, the unit modifies the point interval by deleting every other point so that the number of points in the track is halved. The unit then records the track at this longer interval.



Points deleted to modify the point interval

If the memory is full

When you record a track, the track's data is stored in memory - in the unit's memory or in the IC card's memory - whichever device you have specified. If the message "Insufficient memory" appears, this indicates that the device's memory is full, which means that you will not be able to save the track until additional memory is made available. To make more memory available for the track, first check the unit's memory by choosing System Information from the menu. Then either delete any unneeded data (points, routes, etc.) from memory, or move data from the unit's memory to an IC card's memory. To delete data from the unit, see "Deleting Points" on page 34, "Deleting Routes" on page 38, "Deleting Tracks" on page 50, and "Releasing Zones" on page 53. For more information on using IC memory cards, see "Using IC Memory Cards" on page 60.

Note:
When storing data onto an IC memory card choose the appropriate card from the Memory Device option in the Original Setting menu.

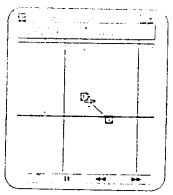
Displaying Tracks

To display the recorded track:

1 **Press the F3 key (TRACK).**

2 **Choose DISPLAY from the Track menu.**

3 **Select the track to display.**



The track is displayed.

To	Press
Stop displaying	F1 key (STOP)
Pause	F2 key (❚❚)
Display (fast backward)	Hold down F3 key (◀◀)
Display (fast forward)	Hold down F4 key (▶▶)

Searching for Tracks

You can search for tracks when selecting tracks to display, modify, and delete. The following search methods are available to search for tracks. You can assign multiple methods.

Memory: Selects the memory device in which a track to be searched for is stored.

Text: Searches for a track by the track name that begins with the assigned text.

Criteria: Releases all the search criteria that are currently assigned.

Note:
You can only set one item for each search method.

To search for a track:

1 **Press the F3 key (TRACK).**

2 **Select the function: DISPLAY, DELETE or MODIFY from the Search menu.**

3 **Press the F4 key (SEARCHT).**

4 **Select the search method.**

5 **Select the track.**

To cancel searching for a track, press the F1 key (QUIT).

To release the current search criteria:
1 Press the F3 key (TRACK).
2 Select the function: DISPLAY, DELETE, or MODIFY from the Search menu.
3 Press the F4 key (SEARCHT).
4 Choose DELETE CRITERIA from the Search menu.
5 Choose YES to release the criteria.

Modifying Track Names

To modify a track name:

1 **Press the F3 key (TRACK).**

2 **Choose MODIFY from the Track menu.**

3 **Select the track to modify.**

4 **Modify the name.**

To cancel modifying a track name, press the F1 key (QUIT).

Deleting Tracks

To delete a track:

1 **Press the F3 key (TRACK).**

2 **Choose DELETE from the Track menu.**

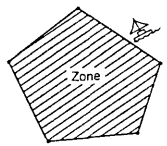
3 **Select the track to delete.**

4 **Choose YES to delete the selected track.**

To cancel deleting a track name, press the F1 key (QUIT) or choose NO in step 4.

Specifying Zones

This section explains how to specify zones, which you can use to help you navigate. By setting up zones, you can use the zone alarm to alert you when you are entering a specific zone.



In POS mode, you can set, display, and release zones.

To enter POS mode, press the POS key.

To turn off the zone alarm, set the zone alarm to Off in the Alarm Setting menu (see page 73).

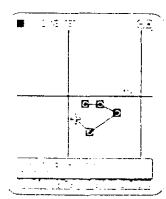
Setting Zones

To set a zone:

1 **Press the F4 key (ZONE).**

2 **Choose SET from the Zone menu.**

3 **Specify the outline points of the zone repeatedly until the zone is defined. Press the ENTER key to make the selection of each point.**
To continue specifying the points, press the ENTER key.
To specify the previous point, press the RECALL key.



Notes:
- To specify a point, refer to "Specifying Positions" on page 25.
- You must specify a minimum of three points to make a zone. You can use a maximum of 19 points to make a zone and a maximum of 200 points for all zones.

4 **When you have finished making the selection of all points, press the F3 key (END) to set the zone.**

To cancel setting a zone, press the F1 key (QUIT).

If the memory is full

When you set up a zone, the zone's data is stored in memory - in the unit's memory or in the IC card's memory - whichever device you have specified. If the message "Insufficient memory" appears, this indicates that the device's memory is full, which means that you will not be able to save the zone until additional memory is made available. To make more memory available for the zone, first check the unit's memory by choosing System Information from the menu. Then either delete any unneeded data (points, routes, etc.) from memory, or move data from the unit's memory to an IC card's memory. To delete data from the unit, see "Deleting Points" on page 30, "Deleting Routes" on page 38, "Deleting Tracks" on page 50, and "Releasing Zones" on page 53. For more information on using IC memory cards, see "Using IC Memory Cards" on page 60.

Note:
When storing data onto an IC memory card, choose the appropriate card from the Memory Device option in the Original Setting menu.

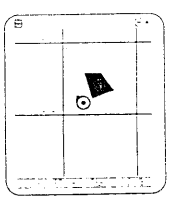
Displaying Zones

To display specified zones:

1 Press the F4 key (ZONE).

2 Choose DISPLAY from the Zone menu.

3 Choose ON to display zones.



The zone is displayed.

If you do not want to display zones, choose OFF in step 3.

To cancel displaying zones, press the F1 key (QUIT).

Releasing Zones

To release the setting of a zone:

1 Press the F4 key (ZONE).

2 Choose DELETE from the Zone menu.

3 Select the zone using the + cursor.

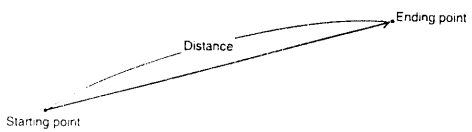
4 Choose YES to release the setting of the selected zone.

To cancel releasing the setting of a zone, press the F1 key (QUIT) or choose NO in step 4.

Measuring Your Course Length

This section explains how to measure your course length.

The unit can measure the distance between two positions (see the figure below):
- From a point to a point
- From a point to the + cursor's position
- From the current position to a point
- From the current position to the + cursor's position



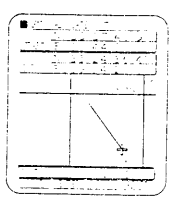
To measure the distance

1 Press the MENU key to enter MENU mode.

2 Choose CALCULATE DISTANCE from the menu.

3 **Specify the starting point of the distance.**
To move the +cursor to your current position, press the F3 key (POS).

4 **Specify the ending point of the distance.**
The distance is calculated and displayed.



To continue calculating the distance, repeat step 4.

To calculate a different distance, first press the F4 key (RESET), then repeat steps 3 and 4.

To cancel measuring the distance, press the F1 key (QUIT).

The unit calculates the distance based on the method that is set in the Bearing Calculation System option from the Positioning Setting menu. See page 70 for details.

Note:
To specify a point, refer to "Specifying Positions" on page 25

Displaying a Point Memo

This section explains how to display a point memo, such as notes about a point.

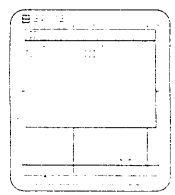
In POINT mode, you can enter a memo for each point you created.
You can display this memo from menu.

To display a point memo:

1 **Press the MENU key to enter MENU mode.**

2 **Choose MEMO from the menu.**

3 **Select the point to display memo.**
Memo is displayed.



To cancel the memo display, press the F1 key (QUIT).

Displaying a Point Memo in POINT mode

You can display a point memo by selecting a point from the point list or directly specifying a point from the grid display in POINT mode.

To display a point memo:
1 Press the POINT key to enter POINT mode.
2 Select a point from the point list, or specify a point from the grid display using the + cursor.
3 Press the ENTER key.

Displaying the World Clock

This section explains how to display the world clock.

You can display the local time of major cities in the world using the world clock. For details on the locations and time differences of the cities in the world clock, see "Time Difference Chart" on page 81.

To display the world clock:

1 **Press the MENU key to enter MENU mode.**

2 **Choose WORLD CLOCK from the menu.**
The world clock, which shows local times of two cities, is displayed.

To change the cities in the world clock:
1 Press the F3 or F4 key (CHGCITY).
To change the city displayed on the left in the world clock, press the F3 key.
To change the city displayed on the right in the world clock, press the F4 key.
2 Select the city.

To cancel the world clock display, press the F1 key (QUIT).

Note:
- When the unit is not receiving the GPS satellites, the error of the time display may increase.
- When you turn on the unit while the antenna is disconnected from the unit, the time display may change.
- Because the timing information is received from the GPS satellites, you do not need to adjust the time display's error.

Displaying the System Information

This section explains how to display the system information.

The unit can display the following system information:
- Amount of memory used
- Amount of data (points, routes, and tracks) stored in the unit
- Power counter (the counter starts when the power turns on; unit in minutes)

Use this information to check how much of the unit's memory is used.

To display the system information:

1 **Press the MENU key to enter MENU mode.**

2 **Choose SYSTEM INFORMATION from the menu.**
The system information is displayed.

About the power counter
You can check the amount of the batteries used. When you change the batteries, press the F4 key (RESET) to reset the counter. The counter returns to 0 minute and starts counting for the new batteries.

To cancel the system information display, press the F1 key (QUIT).

Initializing the Unit's Memory

This section explains how to initialize the unit's memory.

Initialize the unit's memory when you want to delete all data stored in the unit's memory.

To initialize an IC memory card, see "Initializing Cards" on page 66.

To initialize the unit's memory:

1 **Press the MENU key to enter MENU mode.**

2 **Choose INITIALIZE UNIT MEMORY from the menu.**

3 **Choose YES to initialize the unit's memory.**

To cancel initializing the unit's memory, press the F1 key (QUIT) or choose NO in step 3.

Note:
The settings made in the menus are not initialized.

Displaying the Satellite Status

You can check the status of the satellites at any time in MENU mode. The unit automatically selects the best three or four satellites (depending on availability) to use to determine your position. By displaying the satellite status, you can determine which satellites the unit is using to calculate position, the number of satellites being used to calculate the position, and which satellites are in view. You can also check the DOP value.

To display the satellite status:

1 **Press the MENU key to enter MENU mode.**

2 **Choose SATELLITE STATUS DISPLAY from the menu.**
The satellite status display appears.

To cancel the satellite status display, press the F1 key (QUIT).

Symbols
The symbols for each satellite have the following meaning:

Symbol	Meaning
★ IN USE	The unit is using this satellite to calculate the position.
☆ STAND-BY	The unit is receiving this satellite but not using it to calculate the position.
◌ SEARCHING	The unit is searching for the satellites

Using IC Memory Cards

This section explains how to use optional IC memory cards with the unit. For more information, see the documentation that comes with the card.

When using IC memory cards, insert the cards before powering on the unit. You can use up to two cards at a time.

Notes on usage:

- Be sure to use only cards that have the (PHS) mark on it.
- Be sure to turn off the power to the unit when inserting and removing cards.
- To protect the unit's memory, do not insert or remove the battery magazine or external power source, such as the car battery cord, during operation.
- Store the card in its plastic case when you are not using it.
- Do not bend or drop cards.
- Do not expose cards to static electricity, heat, direct sunlight, moisture, or mechanical shock.
- Do not touch the card terminals with your finger. Do not place the card terminals close to metal. If the terminals are dirty, clean them with the cleaning tissue (supplied).
- If you have not used a card for a prolonged period of time, the card terminals may be dirty with rust or dust. Be sure to clean the terminals before use.
- Make a backup copy for your important data.
- When a map card or point database card is used, the Geodetic System is automatically changed to the setting the card employs.
- When two cards are inserted, Card 1 have priority over Card 2.

Note on the IC memory card slots:

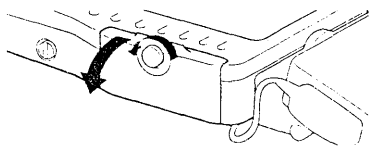
The slots are designed to be slightly stiff to protect the card and to prevent intrusion of dust and water.

Inserting Cards

To insert a card into the IC memory card slot:

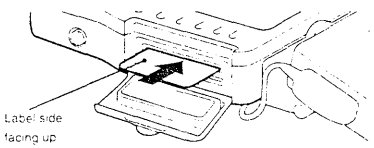
Note:
Turn off the power to the unit before inserting a card.

1 Turn the screw toward "OPEN," then open the cover.

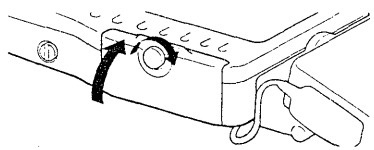


2 Insert the card into the slot with label side facing up.

Note



3 Close the cover and turn the screw toward "CLOSE" to tighten it.

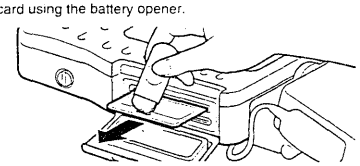


Removing Cards

To remove a card from the IC memory card slot:

Note:
Be sure to turn off the power to the unit before removing a card.

1 Loosen the screw toward "OPEN," then open the cover.
2 Put the tip of the battery opener (supplied) into the groove of the card, then pull out the card using the battery opener.



3 Close the cover and turn the screw toward "CLOSE."

Using IC Memory Cards

About Map Cards and Point Database Cards

You can use commercially available cards, such as map cards that store map data to be displayed on the screen and point database cards which store point database to be used as navigation points. For details on the use of those cards, refer to the manuals that came with the cards.

Note:
When you use a commercially available map card or point database card, the Geodetic System is set to the one employed on the card.

About IC Memory Cards

You can use IC memory cards to store data such as points, routes, etc. IC memory cards are useful when the unit memory is full or when you want to record flight or navigation records.

In CARD mode, you can store and copy data onto cards, copy the card's data to the unit memory, and use applications in cards.

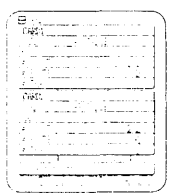
To enter CARD mode, press the CARD key.

Displaying the Card Information

The unit can display the following information about the card that is being used:
- Type of card
- Amount of memory used
- Amount of data (points, routes, and tracks) stored in the unit

Use this information to check how much of the card's memory is used.

The card information is initially displayed when you press the CARD key.



Storing Data onto Cards

To store data onto a card:

1 **Press the F1 key (SAVE).**

2 **If the selected card to store data to is incorrect, choose MEMORY and select the correct card.**

3 **Select the type of data to store.**

4 **Select the names of data to store.**

You can select data listed in consecutive lines in the menu. To select data listed in consecutive lines:
1. Select the starting line, then press the F3 key (MULTSEL).
2. Select the ending line, then press the F3 key (MULTSEL).

5 **When you have finished selecting the names of data, press the ENTER or F2 key (ENTER).**

6 **Choose YES to store the data onto the card.**

To cancel storing data onto the card, press the F1 key (QUIT) or choose NO in step 6.

If the memory is full

If the message "Insufficient memory" appears, this indicates that the IC memory card's memory is full, which means that you will not be able to save the data until additional memory is made available. To make more memory available, first check the card's memory by pressing the CARD key to display "Card Information." Then either delete any unneeded data (points, routes, etc.) from the card, or move data from the card's memory to another IC card's memory.

Loading Data from Cards

You can load data from cards by copying the data to the unit's memory.

To load data from a card

1 **Press the F2 key (LOAD).**

2 **If the selected card to load data to is incorrect, choose MEMORY and select the correct card.**

3 **Select the type of data to load.**

4 **Select the names of data to load.**

5 **When you have finished selecting the names of data, press the ENTER or F2 key (ENTER).**

6 **Choose YES to load the data from the card.**

To cancel loading data from the card, press the F1 key (QUIT) or choose NO in step 6.

You can select data that are listed in consecutive lines in the menu. To select data listed in consecutive lines:
1 Select the starting line, then press the F3 key (MULTSEL).
2 Select the ending line, then select press the F3 key (MULTSEL).

If the memory is full

If the message "Insufficient memory" appears, this indicates that the unit's memory is full, which means that you will not be able to save the data until additional memory is made available. To make more memory available, first check the unit's memory by choosing System Information from the menu. Then either delete any unneeded data (points, routes, etc.) from the unit's memory, or move data from the unit's memory to an IC card's memory.

Copying Data from a Card to Another Card

To copy data from one card to another card:

1 **Press the F3 key (OPTION).**

2 **Choose COPY from the Option menu.**

3 **Select the type of data to copy.**

4 **Check the direction of copy by the arrows (card storing data to copy → card to copy data to). If the direction of copy is incorrect, choose DIRECTION OF COPY and select the right direction.**

5 **Select the names of data to copy.**

6 **When you have finished selecting the names of data, press the ENTER or F2 key (ENTER).**

7 **Choose YES to copy the data into the card.**

To cancel copying data, press the F1 key (QUIT) or choose NO in step 7.

Note:
- Before copying data, turn off the unit, and insert both cards into the unit.
- You cannot copy data if the data is "copy protected."

You can select data that are listed in consecutive lines in the menu. To select data listed in consecutive lines:
1 Select the starting line, then press the F3 key (MULTSEL).
2 Select the ending line, then press the F3 key (MULTSEL).

If the memory is full

If the message "Insufficient memory" appears, this indicates that the IC memory card's memory is full, which means that you will not be able to save the data until additional memory is made available. To make more memory available, first check the card's memory by pressing the CARD key to display "Card Information." Then either delete any unneeded data (points, routes, etc.) from the card, or move data from the card's memory to another IC card's memory.

Using IC Memory Cards

Initializing Cards

Initialize IC memory cards when you want to delete all the data stored in cards.

To initialize a card:

1 Press the F3 key (OPTION).

2 Choose INITIALIZE from the Option menu.

3 Choose YES to initialize the card.

To cancel initializing the card, press the F1 key (QUIT) or choose NO in step 3.

Warning:
Data stored in the card is lost when you initialize the card.

Using Applications

You can purchase additional IC cards, which contain various applications. The use of the unit may vary depending on the applications.

To start an IC application:

1 Press the F4 key (APPLIC).

2 Select the name of the application.
The application starts. To continue using the application, follow the instructions that came with the application.

To cancel starting an IC application, press the F1 key (QUIT).

Setting the Display

This section explains how to customize the unit's display so that it works best based for your individual needs.

You can change the following settings:

Present Position Display: Place the present position in the center of the screen or move it elsewhere. Default setting is "Fix."

Present Position Mark: Use the arrow mark (⊙) or the cross cursor (+) to display the present position. Default setting is "Arrow."

Scale Display: Display map scale. Default setting is "Off."

Selected Route Display: Display routes during Route Navigation. Default setting is "On."

Track Display: Display the last 100 points from the course travelled even if a track is not recorded. Default setting is "On."

LAT/LON (latitude and longitude) Display: Display latitude and longitude data of present position. Default setting is "Off."

LAT/LON (latitude and longitude) Grid Display: Display latitude and longitude grid. You can set this option only when a map card is used. The grid is always displayed when a map card is not used or your current position is out of the map's display range. Default setting is "Off."

Map Display: Display maps. You can set this option only when a map card is used. Default setting is "On."

Estimated Time Display: Select Estimated Time of Arrival (ETA) or Estimated Time Enroute (ETE). Because the unit calculates both times using a linear distance, the calculated time may be different from the actual time. Default setting is "Arrival."

Destination Direction: Display destination direction during navigation when using the arrow mark to represent the present position. Default setting is "On."

Radar Display: Place North or True Course on top of radar screen. Default setting is "North."

XTE (Cross Track Error) Display: Display cross track error (course deviation indicator). Default setting is "Off."

To change a display setting:

1 **Press the MENU key to enter MENU mode.**

2 **Choose DISPLAY SETTING from the menu.**

3 **Select the option of the setting using the ↑ ↓ key.**

4 **Change the setting using the ↑ ↓ key.**

To continue changing the settings, repeat steps 3 and 4.

When you have finished changing the settings, press the F2 key (SETTING).

The unit backs up the previous settings when you change them. To change the setting to the previous setting, press the F3 key (BACKUP).

To cancel the display setting, press the F1 key (QUIT).

Setting the Positioning Conditions

This section explains how to change the settings of the positioning conditions.

You can change the following settings:

Geodetic System: Select the appropriate Geodetic System used to display latitude and longitude. To determine the Geodetic System used in your area, see "Table of Geodetic Systems" on page 82. Default setting is "WGS84."

Maximum DOP Value: Set acquired position accuracy. The smaller the value is, the higher the position accuracy becomes.
The unit does not update data if the accuracy of the acquired data is lower than the accuracy set in this option. So the unit updates data when the accuracy of the acquired data is higher than the accuracy set in this option.
To use the accurate data, set this option to "1 ~ 4." When set to "1 ~12," the unit uses the data that are acquired in poor reception condition. Default setting is "1 ~ 4."

Bearing: Set true or magnetic bearing (manual or automatic). When set to Manual Magnetic, enter the magnetic variation. The magnetic bearing may be different from the display of compass, etc. Default setting is "True."

Bearing Calculation System: Set calculation system for bearing and distance to Great Circle or Rhumb Line. Great Circle represents the shortest distance between two points on surface of sphere. Rhumb Line represents the line cutting all meridians at same angle, or the line followed by ship sailing in fixed direction.Values for each setting are almost the same except for long distance travel such as crossing a continent or the Pacific Ocean, or the destination is in high latitude. Default setting is "Great Circle."

Unit of Position Display: Select latitude and longitude display: DMS (degrees/minutes/seconds) or DMD (degrees/minutes; minutes in decimal). Default setting is "DMS."

Unit of Distance: Select distance display: m (meter), mile (statute mile), or nmile (nautical mile). Default setting is "m."

Unit of Altitude: Select GPS altitude display: m (meter) or feet. Default setting is "m."

Unit of Velocity: Select velocity display: km/h (kilometer per hour), mph (mile per hour), or knot. Default setting is "km/h."

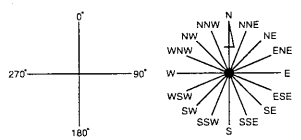
Position Update Rate: Set position update rate to Continuous or Interval. To conserve battery power, set to Interval. Default setting is "Continuous."
Pressing the GPS key turns the power to the antenna on and off according to the setting of the position update rate:

Position Update Rate	Power to the antenna (the GPS key's light)
Continuous	On (light is green) → Off (light is off) → (back to On)
Interval	On at Interval (light is red) → On at Continuous (light is green) → Off (light is off) → (back to On at Interval)

Note:
When the DOP value is more than 12 the unit cannot acquire your current position due to the increasing error.

Note:
When the position update rate is set to Interval, the unit may not be able to acquire the position when it reaches or approaches the destination or specified zone. Therefore, the alarms and the cross track error display may not function, and you cannot store your current position using the MARK key.

Direction Display: Select direction display: degrees or compass points. Set to Degree when determining your travelling direction precisely. Set to Compass when determining your travelling direction roughly. Default setting is "Degree."



Degree display NSEW display

GPS Reset: Initialize the antenna's orbital information. You have to wait for a while during initialization. Use this option if you cannot acquire your current position for more than 20 minutes after resetting your geographic location and place the antenna in a location with no line-of-sight obstructions.

To change a positioning setting:

1 **Press the MENU key to enter MENU mode.**

2 **Choose POSITIONING SETTING from the menu.**

3 **Select the option of the setting using the ↑ ↓ key.**

4 **Change the setting using the ↑ ↓ key.**

To continue changing the settings, repeat steps 3 and 4.

When you have finished changing the settings, press the F2 key (SETTING).

The unit backs up the previous settings when you change them. To change the setting to the previous setting, press the F3 key (BACKUP).

To cancel the positioning setting, press the F1 key (QUIT).

Setting the Clock

This section explains how to change the settings of the unit's internal clock.

You can change the following settings:

Time Difference: Adjust the time difference between your local time and UTC time. To determine the time difference of major cities in the world, see "Time Difference Chart" on page 81. Default setting is "± 00:00."

DST (Daylight Saving Time): Select daylight saving time, which advances time one hour. Default setting is "Off."

Time Display: Select time display as 12-hour or 24-hour. Default setting is "24H."

Date Display: Select date display as yymmdd (year/month/date), mmddyy (month/date/year), or ddmmyy (date/month/year). Default setting is "yymmdd."

To change a time setting:

1 **Press the MENU key to enter MENU mode.**

2 **Choose TIME SETTING.**

3 **Select the option of the setting using the ↑ ↓ key.**

4 **Change the setting using the ↑ ↓ key.**
To set the time difference, use the ← → key.

To continue changing the settings repeat steps 3 and 4.

When you have finished changing the settings, press the F2 key (SETTING).

The unit backs up the previous settings when you change them. To change the setting to the previous setting, press the F3 key (BACKUP).

To cancel the time setting, press the F1 key (QUIT).

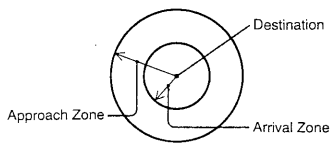
Setting the Alarms

This section explains how to change the settings of the unit's navigation alarms.

You can change the following settings to customize three types of alarms you can use during navigation:

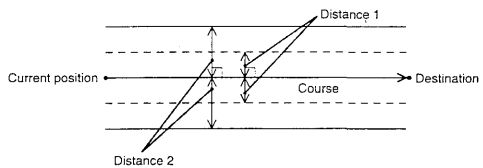
Destination Alarm: Set the alarm when approaching or arrived at your destination. Distances (radius of zone) to determine approach or arrival can be set. Default settings are: the alarm is "On," Arrival Zone is "300 m," and Approach Zone is "500 m."

Note:
Approach Zone must be larger than Arrival Zone.



XTE (Cross Track Error) Alarm: Set the course deviation alarm during navigation. Distances to determine acceptable limit of the course deviation can be set in two stages. Default settings are: the alarm is "On," Distance 1 is "300 m," and Distance 2 is "500 m."

Note:
Distance 2 must be larger than Distance1.



Zone Alarm: Set the alarm when entering the specified zone. To specify zone, refer to "Specifying Zones" on page 51. Default setting is "On."

Setting the Alarms

To change an alarm setting:

1 **Press the MENU key to enter MENU mode.**

2 **Choose ALARM SETTING from the menu.**

3 **Select the option of the setting using the ↑ ↓ key.**

4 **Change the alarm setting to ON or OFF using the ↑ ↓ key.**

5 **When setting the distances, enter values for each setting using the directional cursor key.**

To continue changing the settings, repeat steps 3 and 4.

When you have finished changing the settings, press the F2 key (SETTING).

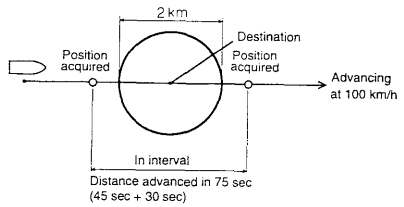
The unit backs up the previous settings when you change them. To change the setting to the previous setting, press the F3 key (BACKUP).

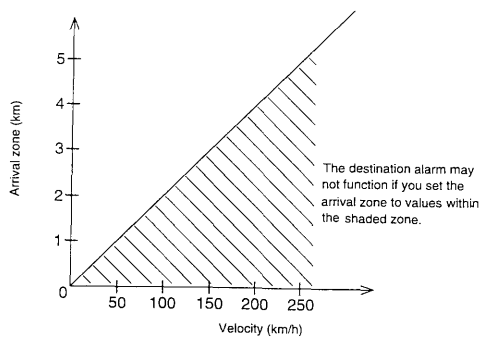
To cancel the alarm setting, press the F1 key (QUIT).

To select the position or digit to enter data, move the cursor using the ← → key.
To enter data, select numbers using the ↑ ↓ key.

Note:
You can only set the distances in 100 meters unit.

Note on setting the position update rate to Interval:
The following graph indicates the distance of arrival zone versus the velocity when the unit is in interval for 45 seconds and then starts acquiring the current position within 30 seconds. For example, when the unit is advancing at 100 km/h, you must set the arrival zone to more than 2 km. Otherwise, the unit may be in interval when it reaches the arrival zone, so that it may not be able to determine its arrival and beep the alarm.





When the position update rate is set to Interval, the unit may not be able to acquire the position when it reaches or approaches the destination or specified zone. Therefore, the alarms and the cross track error display may not function, and you cannot store your current position using the Mark key.

Changing the System Settings

This section explains how to change the system settings, such as language and present position settings. The beep volume and screen contrast can also be set here.

You have already set some of the options in the Original Setting menu on initial setting. In the Original Setting menu, you can change the following settings:

Language: Select the language from English and Japanese. Default setting is "English."

Beep Volume: Adjust the beep volume. Default setting is "High."

Memory Device: Select type of memory (unit, card1, or card2) to save new data. Default setting is "Unit."

Screen Contrast: Adjust the screen contrast.

Position Resetting: Reset your geographic location when you transport the unit to a distance with power turned off.

To change an original settings:

1 **Press the MENU key to enter MENU mode.**

2 **Choose ORIGINAL SETTING from the menu.**

3 **Select the option of the setting using the ↑ ↓ key.**

4 **Change the setting using the ↑ ↓ key.**

To adjust the screen contrast, use the ← → key. To increase the contrast, use the ↑ key; to decrease the contrast, use the ↓ key.

To reset your present position, specify the position using the directional cursor key.

To continue changing the settings, repeat steps 3 and 4.

When you have finished changing the settings, press the F2 key (SETTING).

The unit backs up the previous settings when you change them. To change the setting to the previous setting, press the F3 key (BACKUP).

To cancel the original setting, press the F1 key (QUIT).

Appendix A

Using Optional Accessories

The following optional accessories are available to help you use the IPS-760.

Power sources

In addition to alkaline batteries, you can use the following power sources:

- NP-IPS76 rechargeable battery pack
- Car battery (12/24 V), using the DCC-E260L/HG car battery cord

Using the rechargeable battery pack
You can use the Sony NP-IPS76 rechargeable battery pack (not supplied) to supply power to your unit. The unit can operate continuously for about 3 hours on the NP-IPS76 battery. Charge the battery when using it for the first time. To charge the battery, use the charger that came with the BC-IPS76K rechargeable battery kit package. For details on use of the battery, refer to the manual that came with the BC-IPS76K rechargeable battery kit.

Using a car battery (12/24 V)
You can use the battery of your, car to supply power to the unit. When using a car battery, you need to use the Sony DCC-E260L/HG car battery cord. For details on use of a vehicle battery, refer to the manuals that came with the car battery cord, etc.

When using a vehicle battery to power the unit, make sure the unit is turned off before you turn the ignition on or off.

12/24 V CAR BATTERY
Use the Sony DCC-E260L/HG car battery cord (not supplied), and connect the unit DC IN 6V jack to the cigarette lighter socket of a car.

Installation and connection

- MAK-IPS76 mount kit
- EXC-IPS7 antenna extension cable (7 m, 23 ft)

Maintenance

- Contact cleaning tissue

IC memory cards

- IPM-032K 32 kbyte memory card

Appendix B

Troubleshooting

This section describes troubleshooting tips. Use the tables below if you have any problems with the unit. If problems continue, consult your nearest Sony Service Center.

Common Problems

The following checks will help you correct problems that you may encounter with your unit. Before going through the checklist below, first refer back to the connection and operating procedures.

Problem	Cause	Corrective Action	Reference Page
The unit does not power on when you press the POWER button.	The battery is discharged. The cover of the IC memory card slots are open. The battery magazine is not properly inserted into the unit.	Replace the battery. Close the cover, then tighten the screw. Insert the battery magazine until the BATTERY RELEASE screw returns to center.	14 61 14
The battery is discharging too quickly.	The backlight has been frequently used.	To conserve the battery, use the backlight only when necessary.	15
The unit does not receive any data from the GPS satellites, even after waiting for a considerable period.	The GPS key is turned off. The location of the antenna is not ideal for receiving GPS satellite signals.	Press the GPS key to turn on the antenna. Move the antenna to a better location.	11 20
You cannot store your current position when you press the MARK key.	The unit does not have enough satellites to determine position. When the position update rate is set to Interval, you cannot store your current position using the MARK key.	Move the antenna to another location, where there are fewer obstructions. When the position update rate is set to interval, press the GPS key to change the rate to Continuous (the light turns green); or change the setting of the position update rate to Continuous in the Positioning Setting menu. Then press the MARK key. The MARK key will be turned on and the current position will be stored.	20 11, 70
The unit does not update latitude and longitude data.	The unit does not have enough satellites to determine position.	Move the antenna to another location, where there are fewer obstructions.	20
You cannot acquire your current position for more than 20 minutes after resetting your geographic location and place the antenna in a location with no line-of-sight obstructions.	You have moved a long distance, such as the back of the earth.	Initialize the antenna's orbital information using the GPS Reset option in the Positioning Setting menu.	71
You cannot read the display well.	The screen contrast setting is incorrect.	Adjust the screen contrast in the Original Setting menu.	76
You cannot use the IC memory card.	The card terminals are dirty. The card is not propely inserted into the slot. The card is inserted into the slot upside down.	Clean the card terminals with the cleaning tissue (supplied). Insert the card fully. Insert the card with label side facing up.	8, 60 61 61
The screen does not appear while using the IC memory card.	The card terminals are dirty. Or, the card terminals are corroded because the card was not used for an extended period of time.	• Clean the card terminals with the cleaning tissue (supplied). • Put the card in and out of the slot several times, then insert the card back into the slot.	8, 60 61
The time display in the Word Clock is incorrect.	The timing information is not received because the antenna is not connected and the GPS key is turned off.	Check connection of the anntenna and press the GPS key to turn on the antenna.	11, 20

System Messages

The following checks will help you correct problems when system messages appear on the screen. The messages are listed alphabetically.

The messages appear in dialog boxes that have an OK button. Choose OK by pressing the ENTER key to make the dialog box and the message disappear before you proceed. Some dialog boxes include a YES button and a NO button to respond to the messages.

Message	Cause	Correective Action	Reference Page
Antenna disconnected.	• The antenna cable is disconnected while you are using the unit. • The power is turned on while the antenna is disconnected.	Connect the antenna to the display/keyboard unit.	20
Battery empty! Turn off power and replace battery.	The battery is completely discharged.	Replace the battery immediately.	14
Beyond grid display unit. Cannot display position higher than latitude of display limit.	Because the unit employs the equidistant cylindrical projection, some deformation of shape towards the poles can be seen in the grid display. When the latitude is more than 70 degrees North or South, the grid is not displayed due to the considerable deformation of shape.	Return your position to the location under latitude 70 degrees. The unit returns to the normal operation.	28
Card 1/Card 2 malfunction. Restore usable data?	The unit cannot use the data from the card 1/ card 2 due to the memory malfunction.	To restore the usable data from the card 1/card 2, choose Yes. To abort all the data in the card 1/card 2 and initialize the card 1/card 2, choose NO.	–
Card 1/Card 2 malfunction. Unit will be powered on again.	The unit cannot use the data from the card 1/ card 2 due to the memory malfunction.	The unit automatically shuts down and powers on again.	–
Card seated improperly. Turn off power and reinsert card.	The card is not properly inserted into the slot. The card is inserted into the slot upside down.	Insert the card fully. Insert the card with label side facing up.	61 61
Card terminals are dirty and/ or scratched. Clean card terminals with cleaning tissue.	The card terminals are dirty and/or scratched.	Clean the card terminals with the cleaning tissue (supplied).	8, 60
Card unreadable. Turn off power and reinsert card.	The card terminals are dirty.	Clean the card terminals with the cleaning tissue (supplied).	8, 60
Card unusable.	The card that has no PXS mark is used.	Use a card that has the PXS mark.	60
Card unusable. Initialize card.	You cannot use the card due to the memory malfunction.	Choose Initialize from the Option menu in Card mode to initialize the card.	66
Check antenna connection and press the "GPS" key.	The antenna cable is not properly connected. The GPS key is turned off.	Check connection of the antenna cable, then press the GPS key to turn on the antenna. Press the GPS key to turn on the antenna	11, 20 11
Data malfunction. Returned to initial settings. Reset data if necessary.	The current settings of data that you have customized in the menu are returned to the initial settings due to data malfunction.	Check the menu settings. Change the setting if necessary. If the data of the initial settings malfunction, the unit displays the initial setting screen. Make the initial settings again.	16, 68-76
Internal lithium battery low. Refer to the manual for replacement.	The built-in lithium batteries are discharged.	Have the lithium batteries replaced by a Sony dealer or any Sony Service Center.	15
Markpoint failed. Satellite reception poor.	The unit does not have enough satellites to determine position. When the position update rate is set to Interval, you cannot store your current position using the MARK key.	Move the antenna to another location, where there are fewer obstructions. When the position update rate is set to Interval, press the GPS key to change the rate to Continuous (the light turns green); or change the setting of the position update rate to Continuous in the Positioning Setting menu. Then press the MARK key. The MARK key will be turned on and the current position will be stored.	20 11, 70

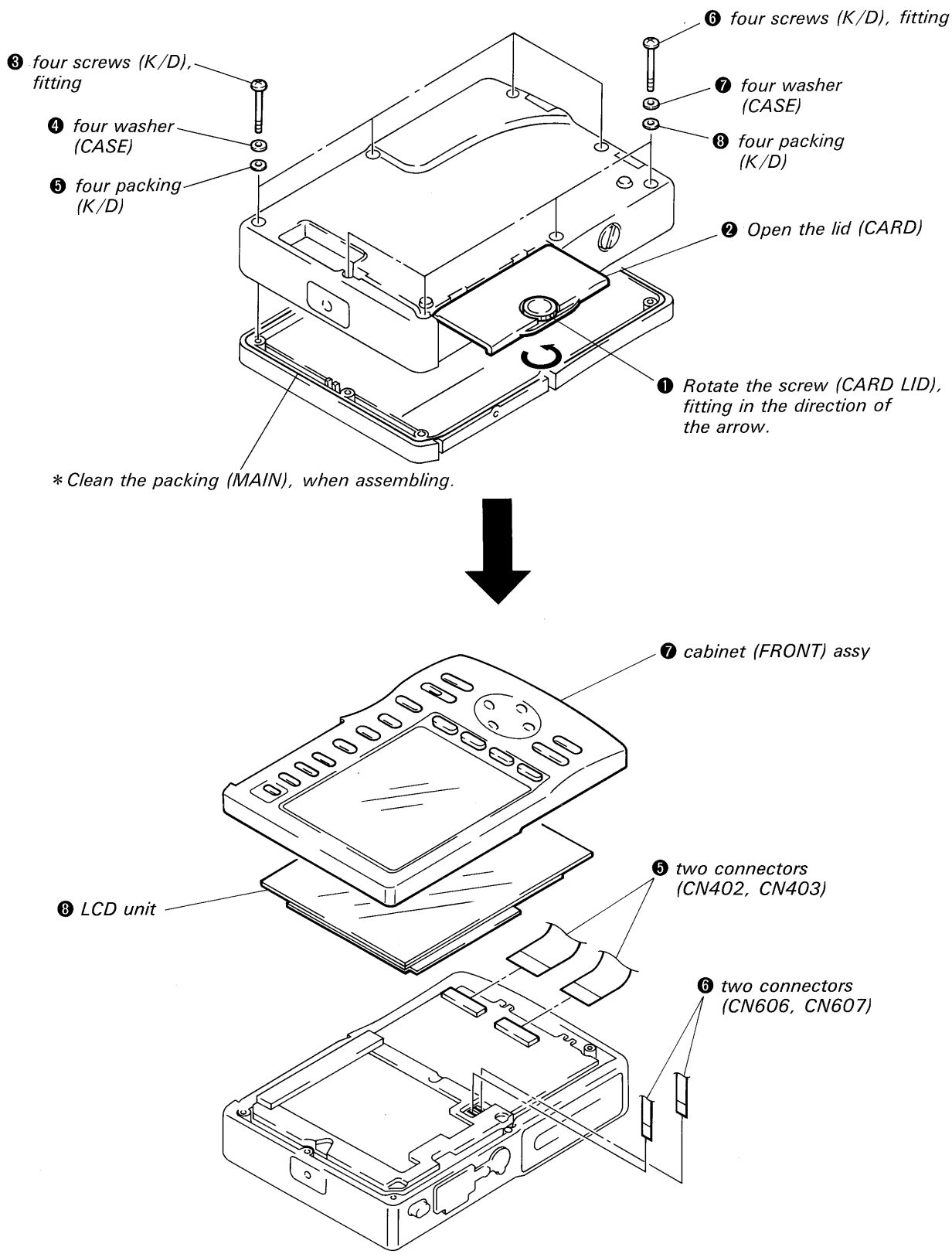
Troubleshooting

Message	Cause	Corrective Action	Reference Page
Navigation mode, Track mode, XTE, or Zone may not be provided when position update rate is set to interval.	Because the position update rate is set to Interval, the unit may not be able to acquire the position when it reaches or approaches the destination or specified zone, and the alarms and the cross track error display may not function.	• When the position update rate is set to Interval, press the GPS key to change the rate to Continuous (the light turns green); or change the setting of the position update rate to Continuous in the Positioning Setting menu. • When settings the alarms, make the settings of the values for the destination alarms and cross track error alarms larger.	11, 70 73
Power was turned off during access to memory. Check memory contents.	The data may not be stored or copied if you turn off the unit while the unit is storing or copying data.	Choose System Information from the menu to check the contents of the unit's memory. Or press the CARD key to check the contents of the card's memory.	57, 62
Present position cannot be stored when position update interval rate is set to interval. To store present position, press the "GPS" key to change position update rate to continuous.	When the position update rate is set to Interval, you cannot store your current position using the MARK key.	When the position update rate is set to Interval, press the GPS key to change the rate to Continuous (the light turns green); or change the setting of the position update rate to Continuous in the Positioning Setting menu. Then press the MARK key. The MARK key will be turned on and the current position will be stored.	11, 70
Reset pressnt position when you use the unit after you have moved a long distance with power turned off.	The data regarding your present position may be lost when you use the unit after you have moved a long distance with power turned off.	Reset your present position in the Original Setting menu.	76
Satellite reception poor.	The GPS key is turned off. The location of the antenna is not ideal for receiving GPS satellite signals.	Press the GPS key to turn on the antnna. Move the antenna to a better location.	11 20
System malfunction. Turn off power. Clean the card terminals and check power supply.	The unit has malfunctioned because the card terminals are dirty and/or scratched. The unit has malfunctioned because the battery is not properly installed.	Clean the card terminals with the cleaning tissue (supplied). Check that the battery is properly installed into the unit.	8, 60 14
Unit memory malfunction. Initialize unit.	You cannot use the unit's memory due to the memory malfunction.	Choose Initalize Unit Memory from the menu to initialize the memory.	58
Unit memory malfunction. Restore usable data?	The unit cannot use the data from the unit's memory due to the memory malfunction.	To restore the usable data from the unit's memory, choose YES. To abort all the data in the unit's memory and initialize the unit's memory, choose NO.	–
Unit memory malfunfction. Unit will be powered on again.	The unit cannot use the data from the unit's memory due to the memory malfunction.	The unit automatically shuts down and powers on again.	–
Warning! Battery low.	The battery is discharged.	Replace the battery.	14

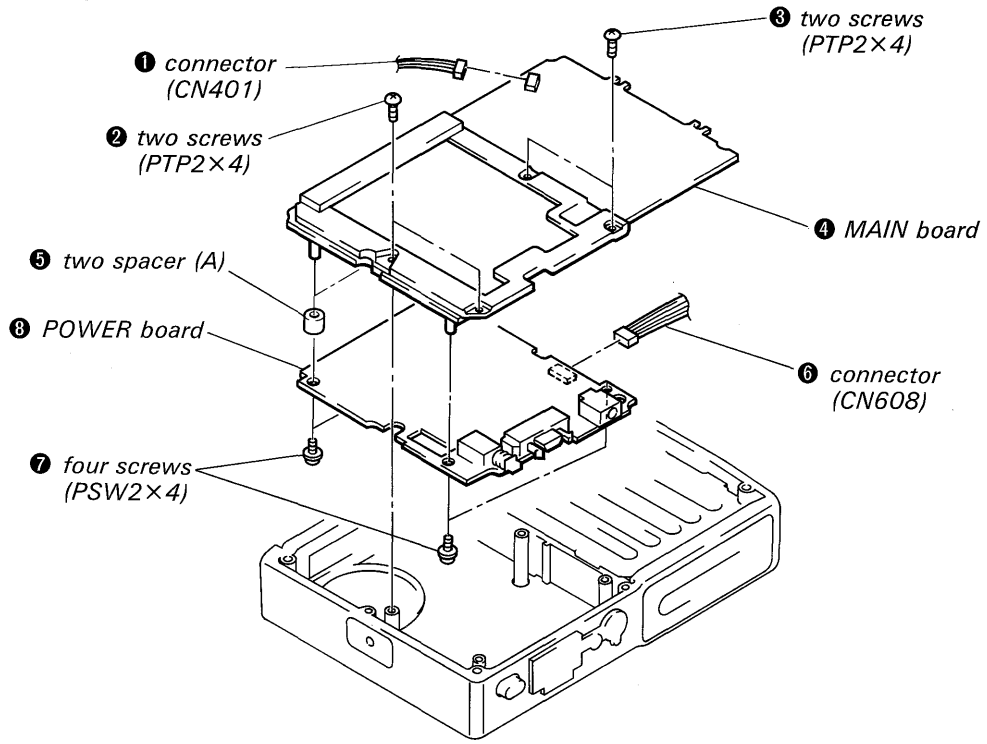
SECTION 2
DISASSEMBLY

NOTE: Follow the disassembly procedure in the numerical order given.

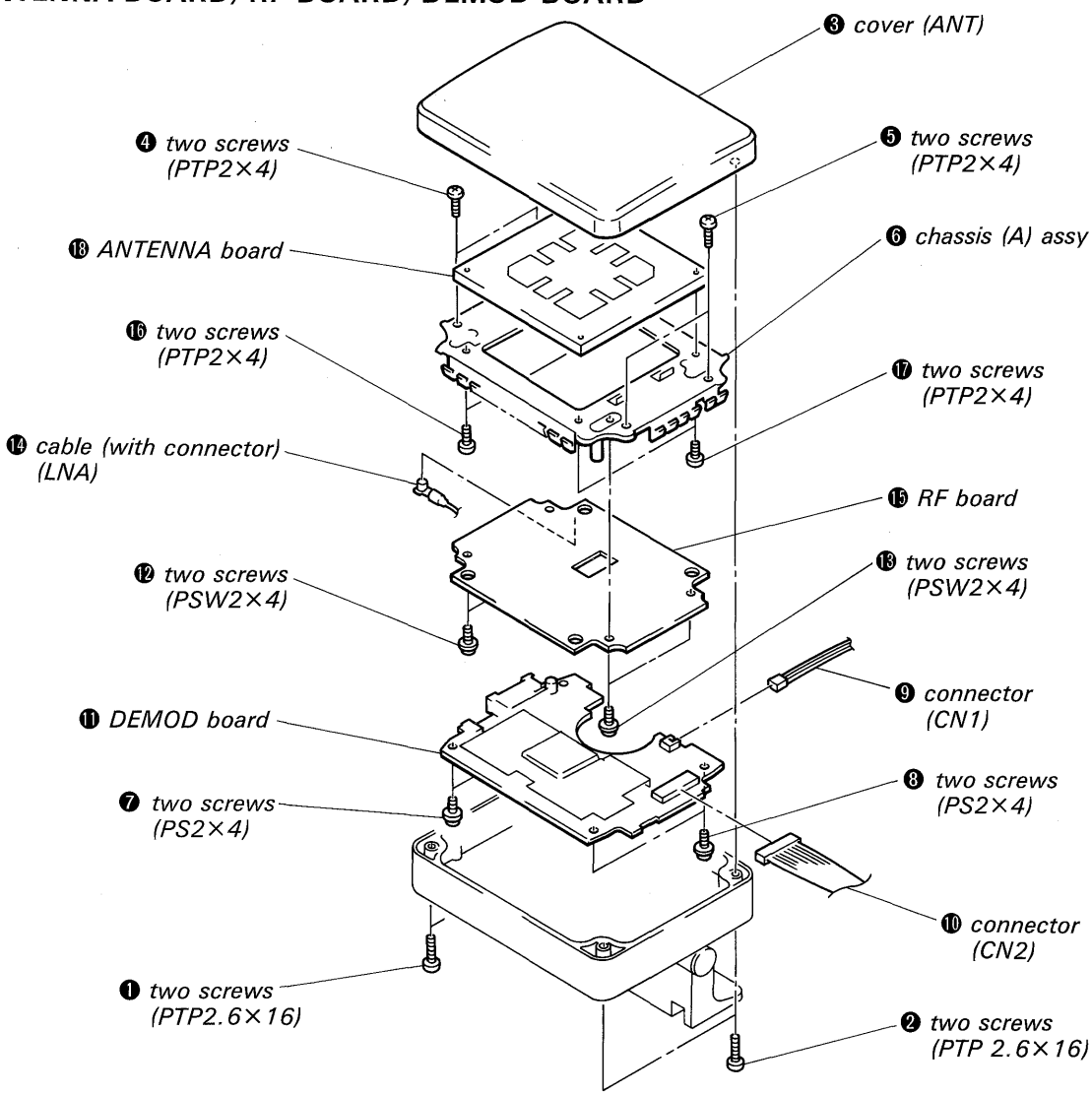
2-1. LCD UNIT


❻ four screws (K/D), fitting
❸ four screws (K/D), fitting
❼ four washer (CASE)
❹ four washer (CASE)
❽ four packing (K/D)
❺ four packing (K/D)
❷ Open the lid (CARD)
❶ Rotate the screw (CARD LID), fitting in the direction of the arrow.
* Clean the packing (MAIN), when assembling.
❼ cabinet (FRONT) assy
❺ two connectors (CN402, CN403)
❽ LCD unit
❻ two connectors (CN606, CN607)

2-2. POWER BOARD/MAIN BOARD

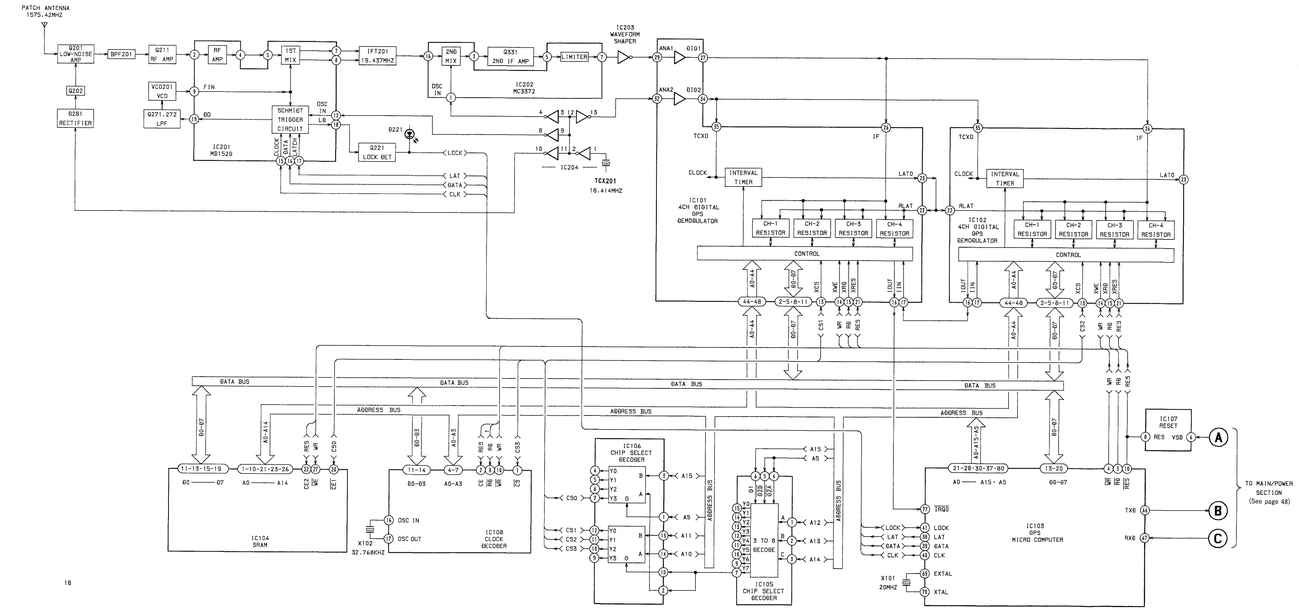


2-3. ANTENNA BOARD/RF BOARD/DEMOD BOARD

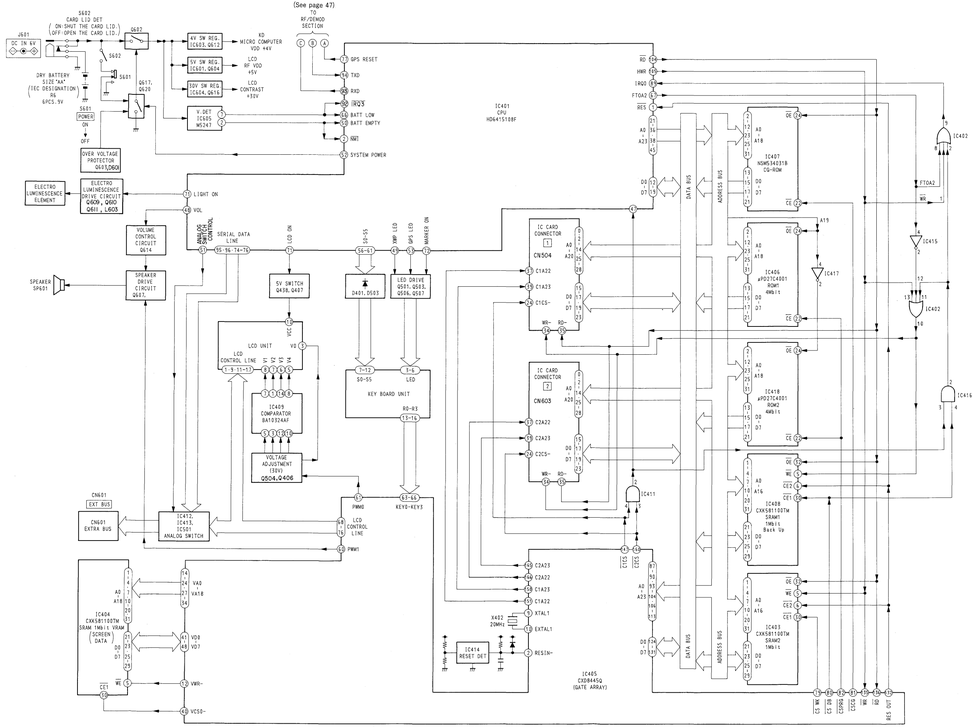


SECTION 3
DIAGRAMS

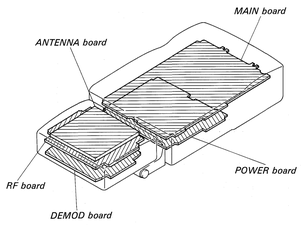
3-1. BLOCK DIAGRAM –ANTENNA Section–



3-2. BLOCK DIAGRAM –MAIN/POWER SUPPLY Section–



3-3. CIRCUIT BOARDS LOCATION

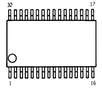


3-4. SEMICONDUCTOR LEAD LAYOUTS

BA10324AF-T1
SN74HCU04ADB
SN74HC4075APW-EL

FA7610N
MB3771PF
M52477FP
TL5001CD

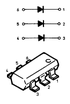
MSM5340318-01GS-KR2
μPD27C4001GW-B35Y



TK11435MTR
TK11445M

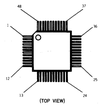
2SK209-G

IMN10

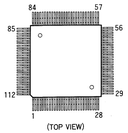


CL-170UR-CD

CXD2901Q



HD6415108F

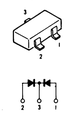


RF5C62

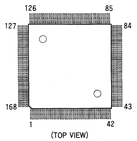
DTC124XU
DTC143ZU
2SA1162-G
2SA1586-YG
2SC2712-YG
2SC3142-J3
2SD1048-X7

3SK166-2

MA152WK
RB400D

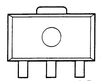


CXD8445Q

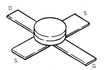


HD6475328F10-71

RH5RA31AA-T1
RH5RA33AA-T1



FHX35LG



DAN202U

RB110C

CXK581100TM-12LB-TL

MB1529-T1

RH5VA24AC

MPL1

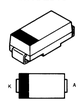
DTZ9.1
ISS355

RB420D

SC7SU04F
SC7S08F
SC14S66F

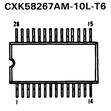
XN4601

EC10QS10



ISS226

CXK58267AM-10L-T6



MC3372MR
MC74AC138MR
MC74AC139MR
MC74HC4053F

2SB804-AW
2SB1114-ZK
2SB1121

3-5. PRINTED WIRING BOARDS —ANTENNA Section—

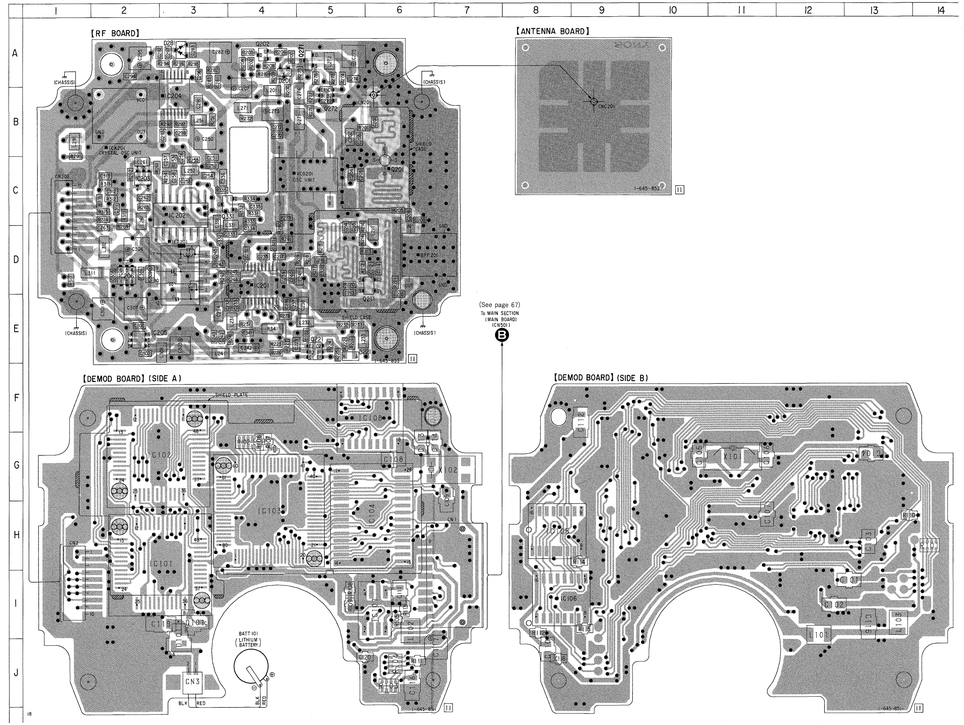
● Semiconductor Location

Ref. No.	Location
D101	I-3
D201	A-4
D221	E-5
D281	A-3
IC101	H-3
IC102	G-2
IC103	H-4
IC104	H-6
IC105	H-8
IC106	I-8
IC107	I-6
IC108	F-6
IC201	D-4
IC202	C-3
IC203	C-2
IC204	B-3
IC205	E-2
IC206	D-2
Q101	I-3
Q201	C-6
Q202	A-4
Q211	D-6
Q221	E-5
Q271	A-5
Q272	B-5
Q331	C-3

Note:

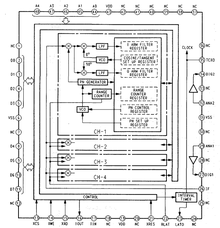
- ● ○——— : parts extracted from the component side.
- ● ■ : parts mounted on the conductor side.
- ● ┌┐ : indicates side identified with part number.
- ● ● : Through hole.
- ● ▨ : Pattern on the side which is seen.
- ○ ▨ : Pattern of the rear side.

●The RF board is of 3-layers structure, but the patterns of intermediate layers (second layer) are not shown.

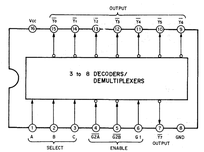


● IC Block Diagrams

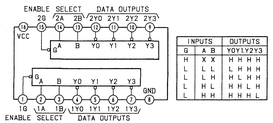
IC101, 102 CXD2901Q



IC105 MC74AC138MR

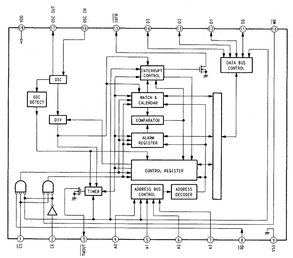


IC106 MC74AC139MR

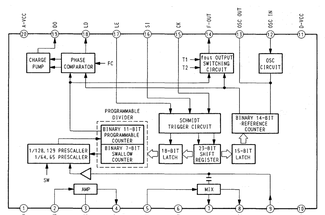


INPUTS		OUTPUTS			
G	A	B	Y0	Y1	Y2	Y3
H	X	X	H	H	H	H
L	L	L	L	H	H	H
L	H	L	H	L	H	H
L	L	H	H	H	L	H
L	H	H	H	H	H	L

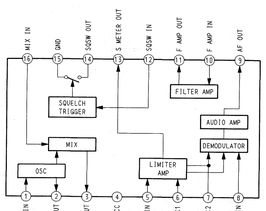
IC108 RF5C62



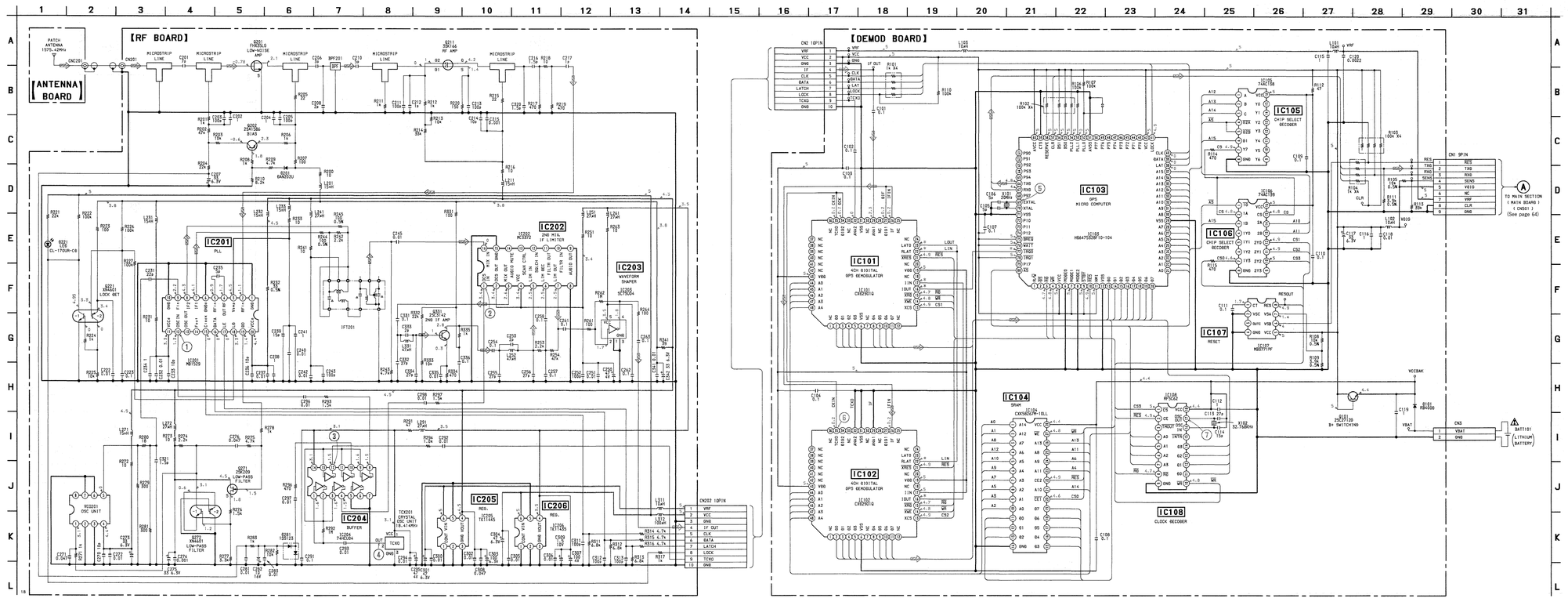
IC201 MB1529-T1



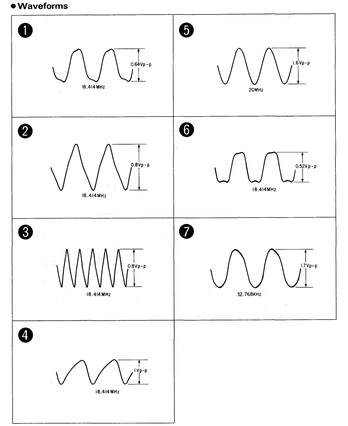
IC202 MC3372MR



3-6. SCHEMATIC DIAGRAM —ANTENNA Section—



● Waveforms

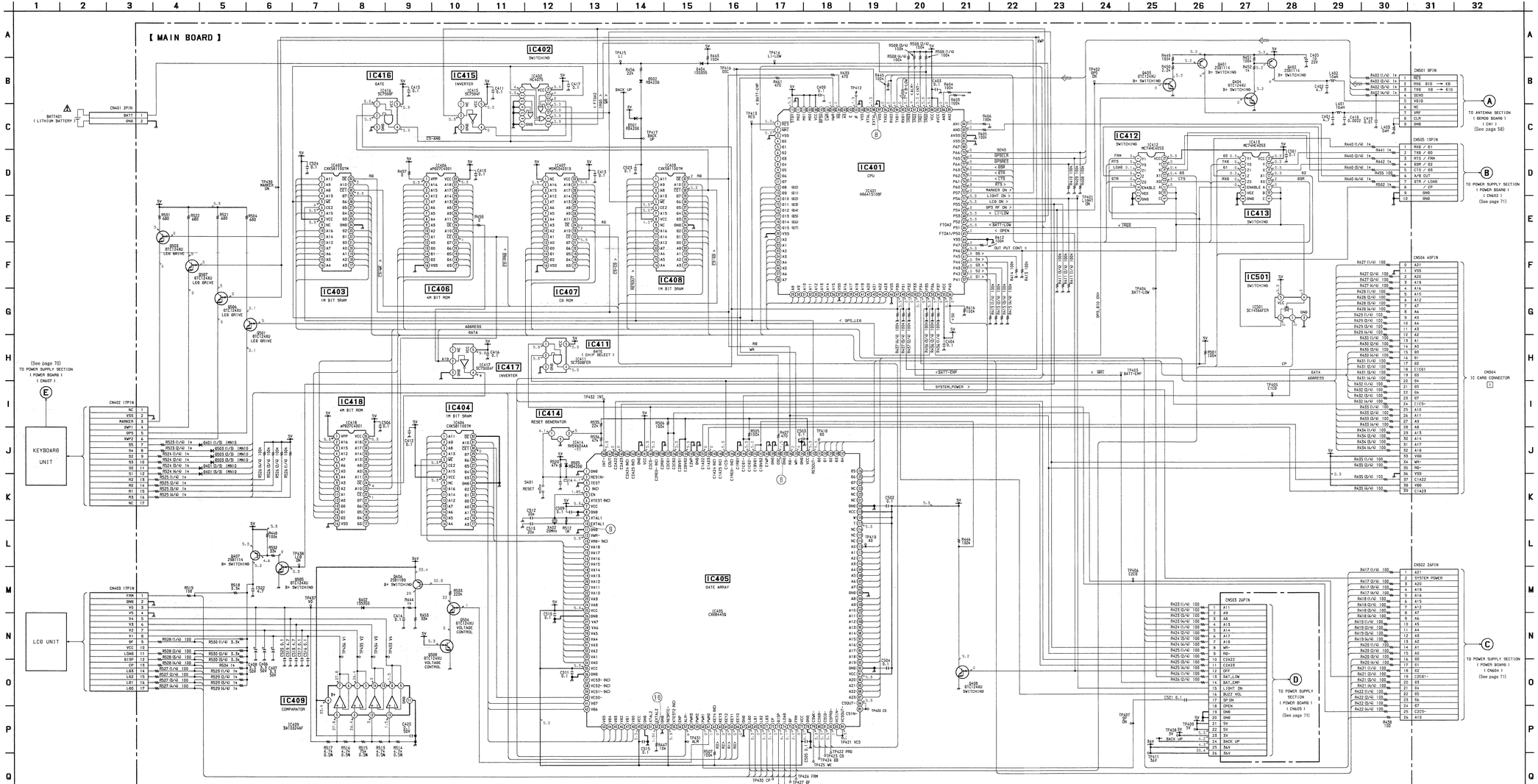


Note:
- All capacitors are in μF unless otherwise noted. pF: μμF
  50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/4 W or less unless otherwise specified.
- % : indicates tolerance.
- △ : internal component.

Note:	Note:
The components identified by mark △ or dotted line with mark △ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque △ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

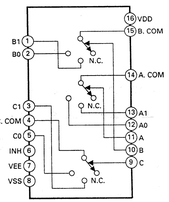
- ⎓ : B+ Line
- Power voltage is dc 9 V and fed with regulated dc power supply from battery terminal.
- Voltage and waveforms are dc with respect to ground under no-signal (detuned) conditions.
- Voltages are taken with a VOM (Input Impedance 10M Ω). Voltage variations may be noted due to normal production tolerances.
- Waveforms are taken with a oscilloscope. Voltage variations may be noted due to normal production tolerances.
- Circled numbers refer to waveforms.
- Signal path : ⇨

3-7. SCHEMATIC DIAGRAM —MAIN Section—

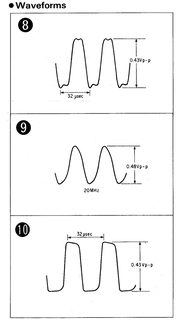

【 MAIN BOARD 】
IC402 SWITCHING
IC416 GATE
IC415 INVERTER
IC401 CPU
IC403 1M BIT SRAM
IC406 4M BIT ROM
IC407 CD ROM
IC408 1M BIT SRAM
IC411 (CHIP SELECT)
IC417 INVERTER
IC418 4M BIT ROM
IC404 1M BIT SRAM
IC414 RESET GENERATOR
IC405 GATE ARRAY
IC409 COMPARATOR
IC412 SWITCHING
IC413 SWITCHING
IC501 SWITCHING
CN401 2PIN
CN402 17PIN
CN403 17PIN
CN501 9PIN
CN502 26PIN
CN503 26PIN
CN504 40PIN
KEYBOARD UNIT
LCD UNIT
TO ANTENNA SECTION (REMOTE BOARD) (CN1) (See page 58)
TO POWER SUPPLY SECTION (POWER BOARD) (CN602) (See page 71)
TO POWER SUPPLY SECTION (POWER BOARD) (CN605) (See page 71)
TO POWER SUPPLY SECTION (POWER BOARD) (CN604) (See page 71)
CN504 IC CARD CONNECTOR

●IC Block Diagram

IC412, 413 MC74HC4053F



●Waveforms



Note:

- All capacitors are in μF unless otherwise noted. pF: μμF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/4 W or less unless otherwise specified.
- % : indicates tolerance.

Note:	**Note:**
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

- ⎓ : B+ Line
- Power voltage is dc 9 V and fed with regulated dc power supply from battery terminal.
- Voltage and waveforms are dc with respect to ground under no-signal (detuned) conditions.
- Voltages are taken with a VOM (Input Impedance 10M Ω). Voltage variations may be noted due to normal production tolerances.
- Waveforms are taken with a oscilloscope. Voltage variations may be noted due to normal production tolerances.
- Circled numbers refer to waveforms.
- Signal path : ⇨

3-8. PRINTED WIRING BOARDS —MAIN Section—

• See page 50 for Circuit Boards Location. • See page 51, 52 for Semiconductor Lead Layouts.

● Semiconductor Location

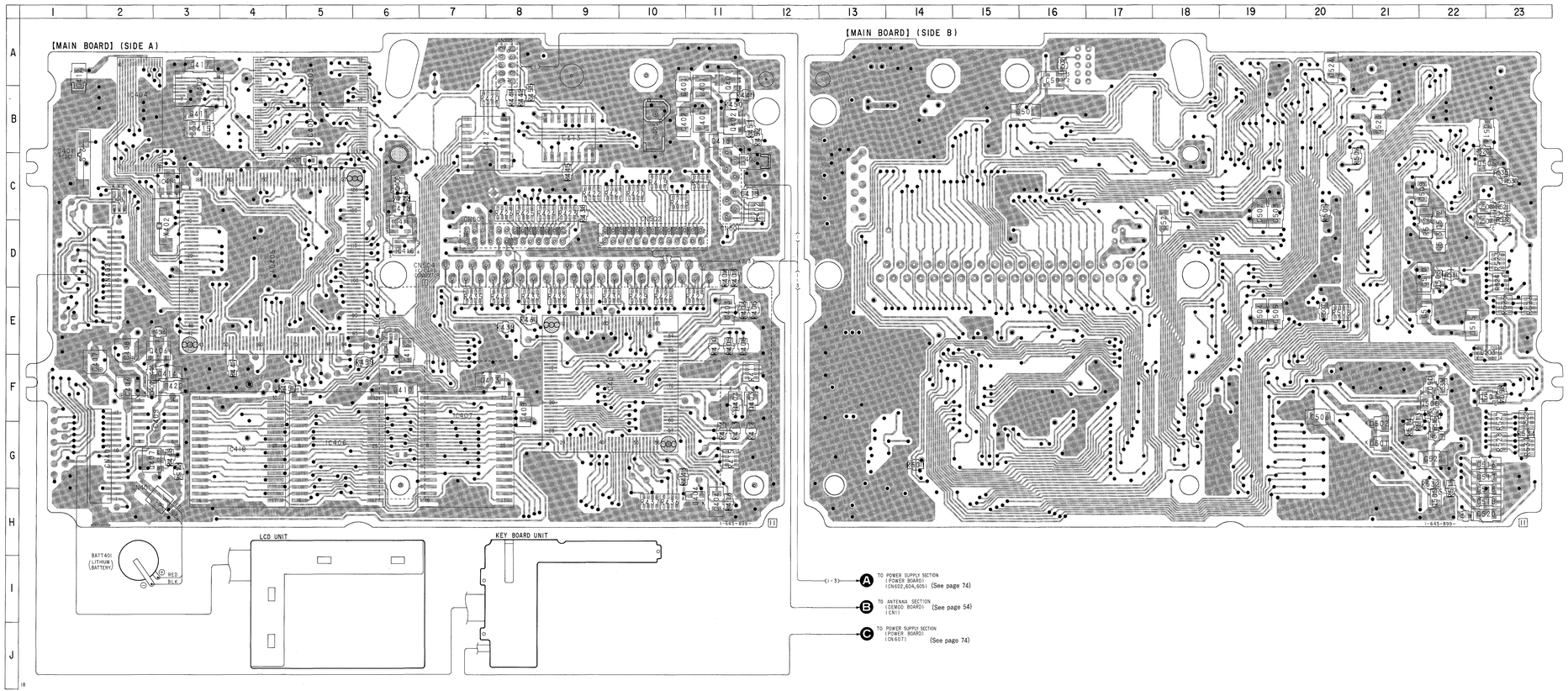
Ref. No.	Location
D401	C-2
D402	F-2
D404	H-11
D501	G-21
D502	G-21
D503	E-23
D505	C-23
IC401	F-9
IC402	B-3
IC403	A-5
IC404	B-2
IC405	D-4
IC406	G-5
IC407	F-7
IC408	B-5
IC409	F-3
IC411	D-6
IC412	B-7
IC413	B-9
IC414	C-3
IC415	B-3
IC416	D-6
IC417	E-6
IC418	G-4
IC501	A-16
Q401	A-11
Q402	B-11
Q403	F-11
Q404	F-11
Q406	E-3
Q407	G-2
Q408	C-6
Q501	F-23
Q503	D-22
Q504	F-22
Q505	H-22
Q506	C-22
Q507	C-22
Q508	F-22

Note:

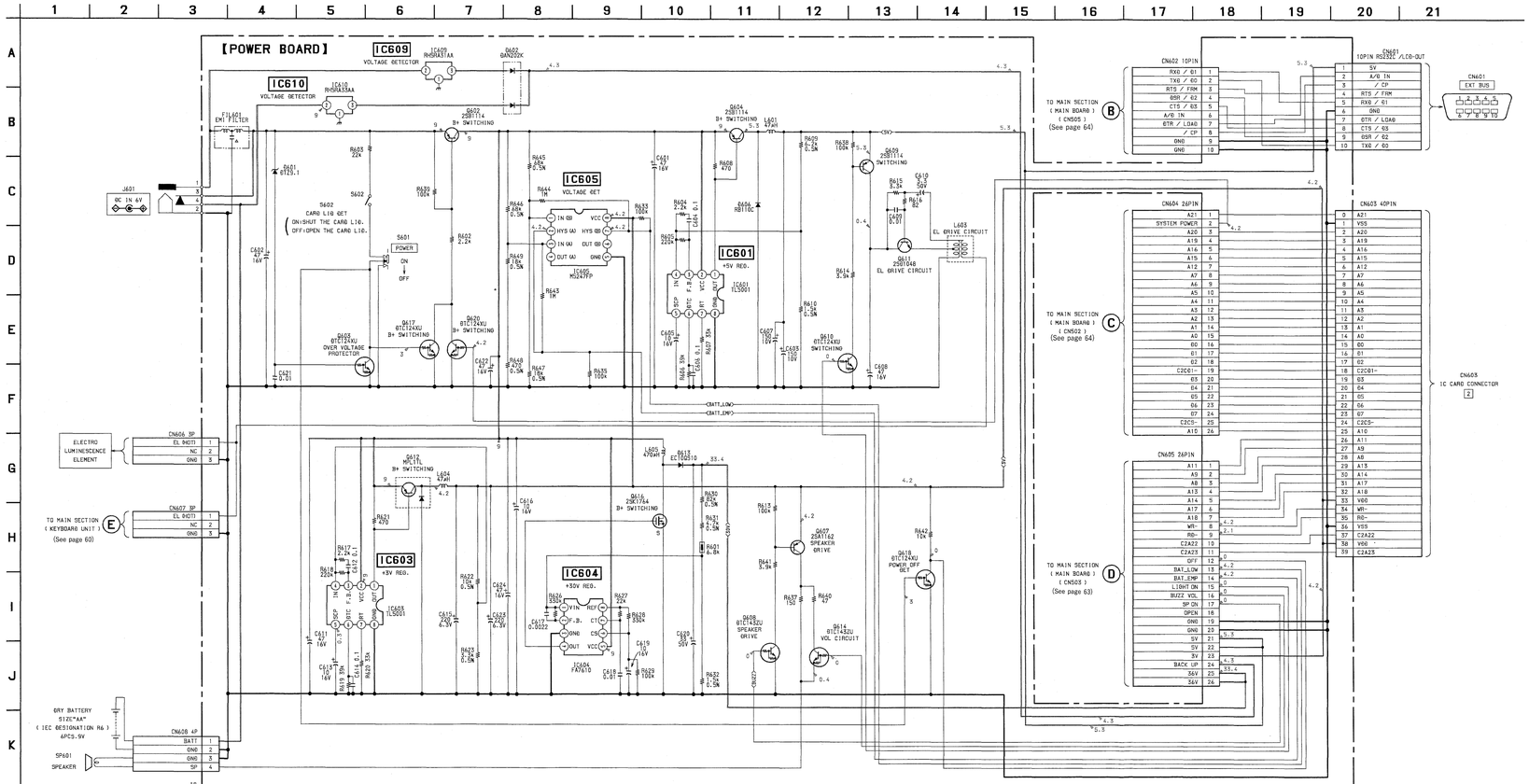
- ○——: parts extracted from the component side.
- ●: Through hole.
- ▒▒: Pattern from the side which enables seeing.

(The other layers' patterns are not indicated.)

- CN501-505 connectors
  These connectors are, in actual, mounted on the side B, but they are shown on the side A due to expression of drawing.
- The main board is of 4-layers structure, but the patterns of intermediate layers (second and third layers) are not shown.


[MAIN BOARD] (SIDE A)
[MAIN BOARD] (SIDE B)
LCD UNIT
KEY BOARD UNIT
BATT401 (LITHIUM) (BATTERY)
RED
BLK
A TO POWER SUPPLY SECTION (POWER BOARD) (CN602,604,605) (See page 74)
B TO ANTENNA SECTION (DEMOD BOARD) (CN1) (See page 54)
C TO POWER SUPPLY SECTION (POWER BOARD) (CN607) (See page 74)

3-9. SCHEMATIC DIAGRAM —POWER SUPPLY Section—



Note:

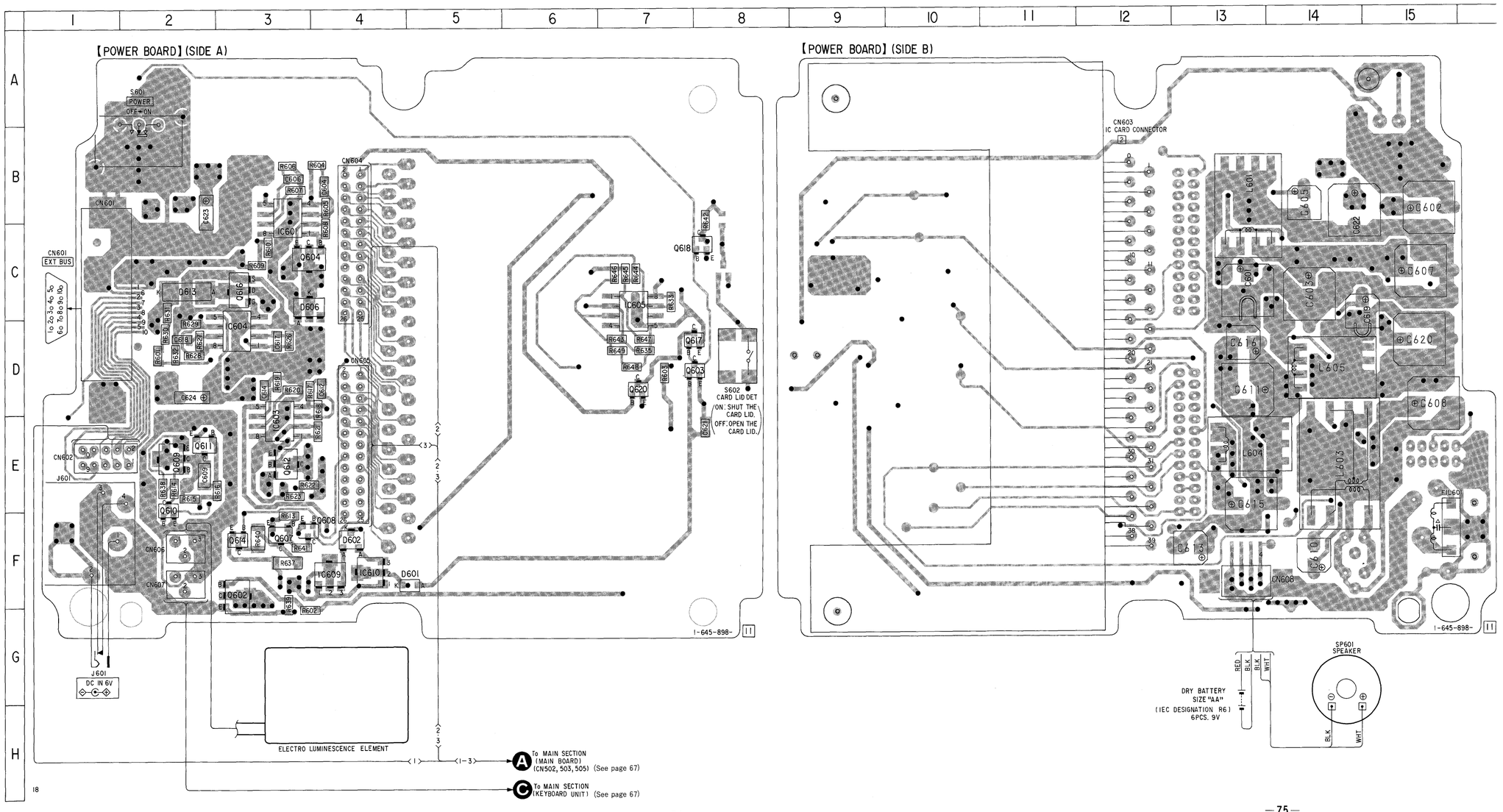
- All capacitors are in μF unless otherwise noted. pF: μμF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/4W or less unless otherwise specified.
- % : indicates tolerance.
- △ : internal component.
- ═══ : B+ Line
- Power voltage is dc 9 V and fed with regulated dc power supply from battery terminal.
- Voltage and waveforms are dc with respect to ground under no-signal (detuned) conditions.
- Voltages are taken with a VOM (input impedance 10M Ω). Voltage variations may be noted due to normal production tolerances.

3-10. PRINTED WIRING BOARDS —POWER SUPPLY Section—

• See page 50 for Circuit Boards Location. • See page 51, 52 for Semiconductor Lead Layouts.

● Semiconductor Location

Ref. No.	Location
D601	F-5
D602	F-4
D606	C-3
D613	C-2
IC601	B-3
IC603	E-3
IC604	D-3
IC605	C-7
IC609	F-4
IC610	F-4
Q602	F-3
Q603	D-7
Q604	C-3
Q607	F-3
Q608	F-3
Q609	E-2
Q610	E-2
Q611	E-2
Q612	E-3
Q614	F-3
Q616	C-3
Q617	D-7
Q618	C-8
Q620	D-7



Note:

- ○—— : parts extracted from the component side.
- ● : Through hole.
- ▒ : Pattern from the side which enables seeing.

(The other layers' patterns are not indicated.)

- The power board is of 4-layers structure, but the patterns of intermediate layers (second and third layers) are not shown.

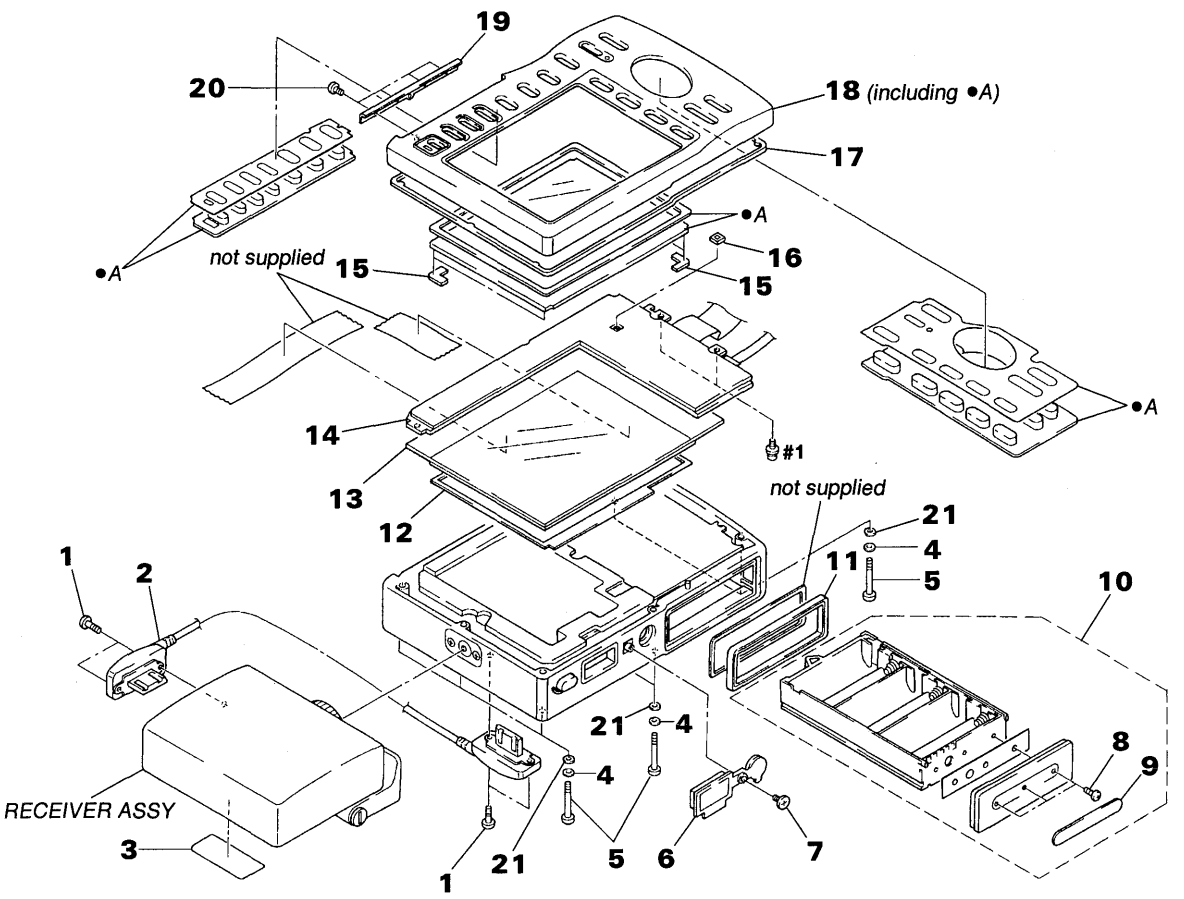
SECTION 4
EXPLODED VIEWS

NOTE:
- –XX, –X mean standardized parts, so they may have some differences from the original one.
- Color Indication of Appearance Parts
  Example:
  KNOB, BALANCE (WHITE)...(RED)
  ↑ ↑
  Parts color Cabinet's color
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.
- Hardware (#mark) list is given in the last of this parts list.
- Abbreviation AUS: Australian model

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

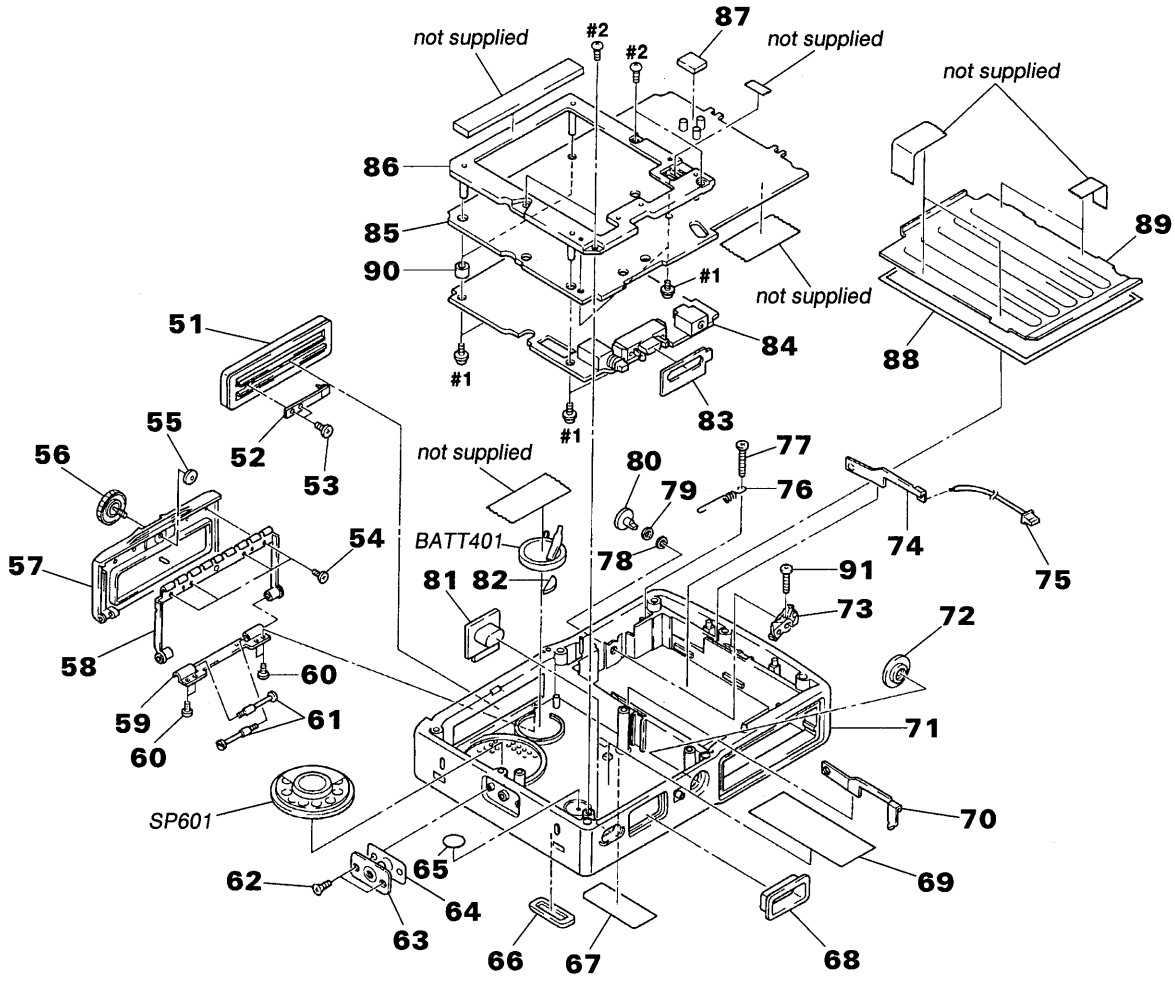
Les components identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

4-1. FRONT CABINET SECTION



Ref.No.	Part No.	Description	Remark
1	3-384-012-01	SCREW (CONNECTOR), FITTING	
2	1-696-676-11	CORD (WITH PLUG)	
*3	3-384-090-01	LABEL, MODEL NUMBER (ANT)	
4	3-370-867-01	WASHER (CASE)	
5	3-384-093-01	SCREW (K/D), FITTING	
6	3-384-009-01	PACKING (LID)	
7	3-384-320-01	SCREW (PACKING), FITTING	
8	3-895-823-21	SCREW (B1.4X3), TAPPING	
*9	3-384-092-01	LABEL (BATT)	
10	X-3365-888-1	CASE (BATT) ASSY	
11	3-383-976-01	PACKING (BATT)	
12	1-809-885-11	ELEMENT, ELECTRO LUMINESCENCE	
13	1-809-380-31	LCD UNIT	
14	1-466-838-11	KEY BOARD UNIT	
15	3-384-006-01	CUSHION (CORNER)	
16	3-389-651-01	CUSHION (MARK)	
17	3-383-975-01	PACKING (MAIN)	
18	X-3365-889-1	CABINET (FRONT) ASSY	
19	3-384-004-01	BRACKET (CARD)	
20	3-895-823-21	SCREW (B1.4X3), TAPPING	
21	3-905-643-01	PACKING (K/D)	

4-2. REAR CABINET SECTION

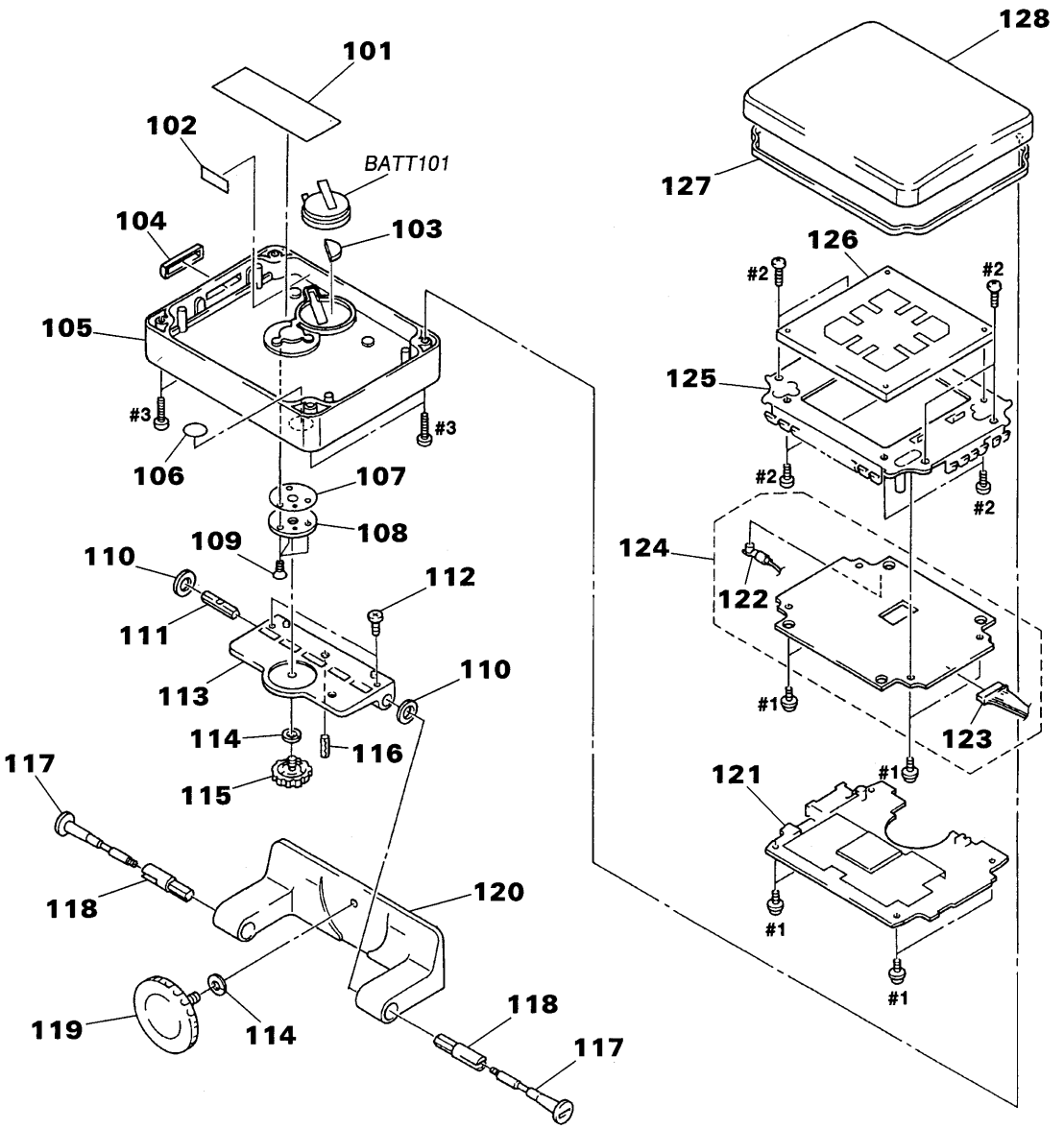


The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	Les components identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

Ref.No.	Part No.	Description	Remark
51	X-3365-784-1	PACKING (CARD) ASSY	
52	3-383-979-01	SPRING (CARD SW)	
53	3-703-816-31	SCREW (M1.4X1.6), SPECIAL HEAD	
54	3-895-823-01	SCREW (B1.4X2.3), TAPPING	
55	3-327-710-01	RING, RETAINING	
56	3-384-001-01	SCREW (CARD LID), FITTING	
57	3-383-998-01	LID (CARD)	
*58	3-383-999-01	CHASSIS (CARD)	
59	3-384-003-01	BRACKET	
60	3-895-823-21	SCREW (B1.4X3), TAPPING	
61	3-384-000-01	SCREW (CARD), FITTING	
62	3-753-917-01	SCREW (2X4), TAPPING	
63	3-384-013-01	SCREW (BRACKET), FITTING	
64	3-384-015-01	SHEET (BRACKET)	
65	3-377-144-01	FILTER (ANT2)	
66	3-383-980-01	PACKING (CONNECTOR)	
*67	3-384-091-01	LABEL, MODEL NUMBER (K/D)	
68	3-387-727-01	PACKING (BUS)	
69	3-389-896-01	SHEET	
70	3-383-990-01	TERMINAL (D), BATTERY	
71	3-383-964-01	CABINET (REAR)	
72	3-384-008-01	PACKING (DC-IN)	
73	3-383-995-01	CAM (BATT)	

Ref.No.	Part No.	Description	Remark
74	3-383-989-01	TERMINAL (C), BATTERY	
75	1-696-757-11	CABLE (WITH CONNECTOR)	
76	3-383-996-01	SPRING (RELEASE)	
77	4-908-792-81	SCREW (B2X11), TAPPING, P1	
78	3-326-148-01	PACKING (A)	
79	3-701-441-11	WASHER, THRUST	
80	3-383-994-01	SCREW (BATT), FITTING	
81	3-384-007-01	PACKING (POWER)	
82	3-384-097-01	SHEET (LITHIUM)	
83	3-384-321-01	SHEET (232C)	
*84	A-3679-458-A	POWER BOARD, COMPLETE	
*85	A-3679-459-A	MAIN BOARD, COMPLETE (AUS)	
*85	A-3679-535-A	MAIN BOARD, COMPLETE (US)	
*85	A-3679-536-A	MAIN BOARD, COMPLETE (EXCEPT US,AUS)	
*86	3-383-982-01	CHASSIS (MAIN)	
87	3-383-997-01	CUSHION (RELEASE)	
88	3-384-319-01	SHEET (LID BATT)	
89	3-384-096-01	LID (BATT CASE)	
90	3-383-983-0	SPACER (A)	
91	3-904-510-01	SCREW (1.4X6)	
⚠BATT401	1-528-432-11	BATTERY, LITHIUM	
SP601	1-504-165-11	SPEAKER (3.6CM)	

4-3. RECEIVER SECTION



The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	Les components identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

Ref.No.	Part No.	Description	Remark
101	3-389-896-01	SHEET	
*102	3-572-759-00	SUPPORT	
103	3-384-097-01	SHEET (LITHIUM)	
104	3-383-980-01	PACKING (CONNECTOR)	
105	3-383-960-01	CASE (ANT)	
106	3-377-144-01	FILTER (ANT2)	
107	3-384-016-01	SHEET (ANT)	
108	3-384-014-01	SCREW (ANT), FITTING	
109	3-753-917-01	SCREW (2X4), TAPPING	
110	3-384-021-01	SPACER (JOINT)	
111	3-384-020-01	SHAFT (A)	
112	4-908-792-21	SCREW (B2X4), TAPPING, P1	
113	3-384-018-01	JOINT (B)	
114	3-384-022-01	WASHER (JOINT)	
115	3-384-023-01	SCREW (B), FITTING	
116	7-626-320-11	PIN, SPRING 3X8	
117	3-384-019-01	SCREW (SHAFT), FITTING	
118	3-384-024-01	SLIDER (JOINT)	
119	3-384-099-01	SCREW (A), FITTING	
120	3-384-017-01	JOINT (A)	
*121	A-3679-460-A	DEMOD BOARD, COMPLETE	
*122	1-696-054-11	CABLE (WITH CONNECTOR) (LNA)	
*123	1-590-985-11	CABLE (WITH CONNECTOR)	
*124	A-3679-461-A	RF BOARD, COMPLETE	
*125	X-3365-815-1	CHASSIS (A) ASSY	
126	1-645-852-11	ANTENNA BORD	
127	3-383-961-01	PACKING (ANT)	
128	3-383-958-01	COVER (ANT)	
⚠BATT101	1-528-425-11	BATTERY, LITHIUM	

SECTION 5
ELECTRICAL PARTS LIST

ANTENNA **DEMOD**

NOTE:
- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX and -X mean standardized parts, so they may have some difference from the original one.
- RESISTORS
  All resistors are in ohms.
  METAL: Metal-film resistor.
  METAL OXIDE: Metal oxide-film resistor.
  F: nonflammable
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- SEMICONDUCTORS
  In each case, u : μ, for example:
  uA··· : μA···, uPA··· : μPA···,
  uPB··· : μPB···, uPC··· : μPC···, uPD··· : μPD···
- CAPACITORS
  uF : μF
- COILS
  uH : μH
- Abbreviations CND: Canadian model AUS: Australian model
  JE: Tourist model

When indicating parts by reference number, please include the board.

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Les components identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

Ref.No.	Part No.	Description			Remark
	1-645-852-11	ANTENNA BOARD			
		**********			
CNC201	1-691-843-11	CONNECTOR, COAXIAL			
**********					
*	A-3679-460-A	DEMOD BOARD, COMPLETE			
		**********			
	3-369-849-01	SHEET (CONNECTOR), ADHESIVE			
*	3-384-585-01	PLATE (DEMOD), SHIELD			
		< CAPACITOR >			
C101	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C102	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C103	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C104	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C105	1-163-088-00	CERAMIC CHIP	5PF		50V
C106	1-163-088-00	CERAMIC CHIP	5PF		50V
C107	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C108	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C109	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C110	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C111	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C112	1-164-830-11	CERAMIC CHIP	1uF	22%	16V
C113	1-163-103-00	CERAMIC CHIP	27PF	5%	50V
C114	1-163-097-00	CERAMIC CHIP	15PF	5%	50V
C115	1-164-830-11	CERAMIC CHIP	1uF	22%	16V
C116	1-164-830-11	CERAMIC CHIP	1uF	22%	16V
C117	1-104-608-11	ELECT CHIP	33uF	20%	6.3V
C118	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C119	1-164-830-11	CERAMIC CHIP	1uF	22%	16V
C120	1-162-966-11	CERAMIC CHIP	0.0022uF	10%	50V
		< CONNECTOR >			
CN1	1-573-215-11	JACK 9P			
CN2	1-573-221-21	PIN, CONNECTOR 10P			
*CN3	1-695-832-21	PIN, CONNECTOR 2P			
		< DIODE >			
D101	8-719-988-07	DIODE RB400D			
		< IC >			
IC101	8-752-338-37	IC CXD2901Q			
IC102	8-752-338-37	IC CXD2901Q			
IC103	8-759-184-89	IC HD6475328F10-71			
IC104	8-752-347-61	IC CXK58267AM-10L-T6			
IC105	8-759-076-02	IC MC74AC138MR			
IC106	8-759-039-10	IC MC74AC139MR			
IC107	8-759-998-49	IC MB3771PF			
IC108	8-759-504-23	IC RF5C62			
		< COIL >			
L101	1-412-029-11	INDUCTOR CHIP	10uH		
L102	1-412-029-11	INDUCTOR CHIP	10uH		
L103	1-412-029-11	INDUCTOR CHIP	10uH		
		< TRANSISTOR >			
Q101	8-729-230-49	TRANSISTOR 2SC2712-YG			
		< RESISTOR >			
R101	1-239-516-11	RESISTOR, NETWORK (1608) 1Kx4			
R102	1-239-517-11	RESISTOR, NETWORK (1608) 100Kx4			
R103	1-239-517-11	RESISTOR, NETWORK (1608) 100Kx4			
R104	1-239-516-11	RESISTOR, NETWORK (1608) 1Kx4			
R105	1-218-716-11	METAL CHIP	10K	0.50%	1/16W
R106	1-216-845-11	METAL CHIP	100K	5%	1/16W
R107	1-216-845-11	METAL CHIP	100K	5%	1/16W
R108	1-218-716-11	METAL CHIP	10K	0.50%	1/16W
R109	1-218-706-11	METAL CHIP	3.9K	0.50%	1/16W
R110	1-216-845-11	METAL CHIP	100K	5%	1/16W
R111	1-218-706-11	METAL CHIP	3.9K	0.50%	1/16W
R112	1-216-805-11	METAL CHIP	47	5%	1/16W
R113	1-216-840-11	METAL CHIP	39K	5%	1/16W
R114	1-216-817-11	METAL CHIP	470	5%	1/16W
R115	1-216-817-11	METAL CHIP	470	5%	1/16W
		< VIBRATOR >			
X101	1-579-650-11	VIBRATOR, CRYSTAL (20MHz)			
X102	1-579-651-11	VIBRATOR, CRYSTAL (32.768kHz)			
**********					

MAIN

Ref.No.	Part No.	Description			Remark
*	A-3679-459-A	MAIN BOARD, COMPLETE (AUS)			
*	A-3679-535-A	MAIN BOARD, COMPLETE (US)			
*	A-3679-536-A	MAIN BOARD, COMPLETE (EXCEPT US, AUS)			
		**********			
		< CAPACITOR >			
C401	1-164-506-11	CERAMIC CHIP	4.7uF		16V
C402	1-164-506-11	CERAMIC CHIP	4.7uF		16V
C403	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C404	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C405	1-135-159-21	TANTALUM CHIP	10uF	10%	20V
C406	1-126-403-11	ELECT CHIP	3.3uF	20%	50V
C407	1-126-403-11	ELECT CHIP	3.3uF	20%	50V
C408	1-126-403-11	ELECT CHIP	3.3uF	20%	50V
C409	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C410	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C411	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C412	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C413	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C414	1-104-329-11	CERAMIC CHIP	0.1uF	10%	50V
C415	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C416	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C417	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C418	1-164-695-11	CERAMIC CHIP	0.0022uF	5%	50V
C419	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C420	1-104-329-11	CERAMIC CHIP	0.1uF	10%	50V
C501	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C502	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C503	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C504	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C505	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C506	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C509	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C510	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C511	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C512	1-163-100-00	CERAMIC CHIP	20PF	5%	50V
C513	1-163-100-00	CERAMIC CHIP	20PF	5%	50V
C514	1-164-830-11	CERAMIC CHIP	1uF	22%	16V
C515	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C516	1-104-329-11	CERAMIC CHIP	0.1uF	10%	50V
C517	1-104-329-11	CERAMIC CHIP	0.1uF	10%	50V
C518	1-164-506-11	CERAMIC CHIP	4.7uF		16V
C519	1-164-506-11	CERAMIC CHIP	4.7uF		16V
C520	1-104-329-11	CERAMIC CHIP	0.1uF	10%	50V
C521	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C522	1-164-506-11	CERAMIC CHIP	4.7uF		16V
C523	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C524	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V

Ref.No.	Part No.	Description	Remark
		< CONNECTOR >	
*CN401	1-695-832-21	PIN, CONNECTOR 2P	
*CN402	1-695-870-21	CONNECTOR, FPC (PC BOARD) 17P	
*CN403	1-695-870-21	CONNECTOR, FPC (PC BOARD) 17P	
CN501	1-573-216-11	JACK 9P	
CN502	1-695-833-11	PIN, CONNECTOR 26P	
CN503	1-695-833-11	PIN, CONNECTOR 26P	
*CN504	1-695-589-11	CONNECTOR 40P (IC CARD CONNECTOR 1)	
CN505	1-573-219-11	PIN, CONNECTOR 10P	
		< DIODE >	
D401	8-719-951-22	DIODE IMN10	
D402	8-719-988-62	DIODE 1SS355	
D404	8-719-988-62	DIODE 1SS355	
D501	8-719-975-43	DIODE RB420D	
D502	8-719-975-43	DIODE RB420D	
D503	8-719-951-22	DIODE IMN10	
D505	8-719-975-43	DIODE RB420D	
		< IC >	
IC401	8-759-083-86	IC HD6415108RVF5	
IC402	8-759-051-21	IC SN74HC4075APW-EL	
IC403	8-752-360-74	IC CXK581100TM-12LB-TL	
IC404	8-752-360-74	IC CXK581100TM-12LB-TL	
IC405	8-759-090-39	IC CXD8445Q	
IC406	8-759-265-90	IC uPD23C8001EAGW-373-E1 (EXCEPT US,AUS)	
IC406	8-759-265-91	IC uPD23C8001EAGW-374-E1 (US)	
IC406	8-759-265-92	IC MB838000BPF-G-5F4-EF (AUS)	
IC407	8-759-099-88	IC MSM534031B-01GS-KR2	
IC408	8-752-360-74	IC CXK581100TM-12LB-TL	
IC409	8-759-075-55	IC BA10324AF-T1	
IC411	8-759-035-26	IC SC7S08F	
IC412	8-759-011-65	IC MC74HC4053F	
IC413	8-759-011-65	IC MC74HC4053F	
IC414	8-759-511-00	IC RH5VA24AC	
IC415	8-759-031-58	IC SC7SU04F	
IC416	8-759-035-26	IC SC7S08F	
IC417	8-759-031-58	IC SC7SU04F	
IC418	X-3367-162-1	IC ROM ASSY(2), IC	
IC501	8-759-030-74	IC SC14S66F	
		< COIL >	
L401	1-412-029-11	INDUCTOR CHIP 10uH	
L402	1-412-029-11	INDUCTOR CHIP 10uH	
L403	1-412-364-11	INDUCTOR 0uH	
		< TRANSISTOR >	
Q401	8-729-805-25	TRANSISTOR 2SB1114-ZK	
Q402	8-729-805-25	TRANSISTOR 2SB1114-ZK	
Q403	8-729-924-46	TRANSISTOR DTC124XU	

Ref.No.	Part No.	Description	Remark
Q404	8-729-924-46	TRANSISTOR DTC124XU	
Q406	8-729-104-26	TRANSISTOR 2SB804-AW	
Q407	8-729-805-25	TRANSISTOR 2SB1114-ZK	
Q408	8-729-924-46	TRANSISTOR DTC124XU	
Q501	8-729-924-46	TRANSISTOR DTC124XU	
Q503	8-729-924-46	TRANSISTOR DTC124XU	
Q504	8-729-924-46	TRANSISTOR DTC124XU	
Q505	8-729-924-46	TRANSISTOR DTC124XU	
Q506	8-729-924-46	TRANSISTOR DTC124XU	
Q507	8-729-924-46	TRANSISTOR DTC124XU	
Q508	8-729-924-46	TRANSISTOR DTC124XU	
		< RESISTOR >	
R402	1-239-516-11	RESISTOR, NETWORK (1608) 1Kx4	
R403	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R404	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R405	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R406	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R407	1-216-817-11	METAL CHIP 470 5% 1/16W	
R408	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R409	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R410	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R411	1-239-517-11	RESISTOR, NETWORK (1608) 100Kx4	
R412	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R413	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R414	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R415	1-239-517-11	RESISTOR, NETWORK (1608) 100Kx4	
R416	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R417	1-239-514-11	RESISTOR, NETWORK (1608) 100x4	
R418	1-239-514-11	RESISTOR, NETWORK (1608) 100x4	
R419	1-239-514-11	RESISTOR, NETWORK (1608) 100x4	
R420	1-239-514-11	RESISTOR, NETWORK (1608) 100x4	
R421	1-239-514-11	RESISTOR, NETWORK (1608) 100x4	
R422	1-239-514-11	RESISTOR, NETWORK (1608) 100x4	
R423	1-239-514-11	RESISTOR, NETWORK (1608) 100x4	
R424	1-239-514-11	RESISTOR, NETWORK (1608) 100x4	
R425	1-239-514-11	RESISTOR, NETWORK (1608) 100x4	
R426	1-239-514-11	RESISTOR, NETWORK (1608) 100x4	
R427	1-239-514-11	RESISTOR, NETWORK (1608) 100x4	
R428	1-239-514-11	RESISTOR, NETWORK (1608) 100x4	
R429	1-239-514-11	RESISTOR, NETWORK (1608) 100x4	
R430	1-239-514-11	RESISTOR, NETWORK (1608) 100x4	
R431	1-239-514-11	RESISTOR, NETWORK (1608) 100x4	
R432	1-239-514-11	RESISTOR, NETWORK (1608) 100x4	
R433	1-239-514-11	RESISTOR, NETWORK (1608) 100x4	
R434	1-239-514-11	RESISTOR, NETWORK (1608) 100x4	
R435	1-239-514-11	RESISTOR, NETWORK (1608) 100x4	
R436	1-239-517-11	RESISTOR, NETWORK (1608) 100Kx4	

Ref.No.	Part No.	Description	Remark
R437	1-239-517-11	RESISTOR, NETWORK (1608) 100Kx4	
R438	1-216-809-11	METAL CHIP 100 5% 1/16W	
R439	1-216-817-11	METAL CHIP 470 5% 1/16W	
R440	1-239-516-11	RESISTOR, NETWORK (1608) 1Kx4	
R441	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R442	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R443	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R444	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R445	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R446	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R447	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R448	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R449	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R450	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R451	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R452	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R453	1-216-839-11	METAL CHIP 33K 5% 1/16W	
R455	1-216-809-11	METAL CHIP 100 5% 1/16W	
R456	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R457	1-216-864-11	METAL CHIP 0 5% 1/16W	
R459	1-216-864-11	METAL CHIP 0 5% 1/16W	
R461	1-216-817-11	METAL CHIP 470 5% 1/16W	
R501	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R502	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R504	1-216-819-11	METAL CHIP 680 5% 1/16W	
R505	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R506	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R507	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R508	1-239-517-11	RESISTOR, NETWORK (1608) 100Kx4	
R512	1-216-121-00	METAL CHIP 1M 5% 1/10W	
R513	1-218-708-11	METAL CHIP 4.7K 0.50% 1/16W	
R514	1-218-708-11	METAL CHIP 4.7K 0.50% 1/16W	
R515	1-218-296-11	METAL CHIP 75K 0.50% 1/16W	
R516	1-218-708-11	METAL CHIP 4.7K 0.50% 1/16W	
R517	1-218-708-11	METAL CHIP 4.7K 0.50% 1/16W	
R518	1-216-827-11	METAL CHIP 3.3K 5% 1/16W	
R519	1-216-809-11	METAL CHIP 100 5% 1/16W	
R520	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R521	1-216-819-11	METAL CHIP 680 5% 1/16W	
R522	1-216-819-11	METAL CHIP 680 5% 1/16W	
R523	1-239-516-11	RESISTOR, NETWORK (1608) 1Kx4	
R524	1-239-516-11	RESISTOR, NETWORK (1608) 1Kx4	
R525	1-239-516-11	RESISTOR, NETWORK (1608) 1Kx4	
R526	1-239-517-11	RESISTOR, NETWORK (1608) 100Kx4	
R527	1-239-514-11	RESISTOR, NETWORK (1608) 100x4	
R528	1-239-514-11	RESISTOR, NETWORK (1608) 100x4	
R529	1-239-516-11	RESISTOR, NETWORK (1608) 1Kx4	
R530	1-239-712-91	RESISTOR, NETWORK (1608) 3.3Kx4	
R531	1-216-819-11	METAL CHIP 680 5% 1/16W	

MAIN POWER

Ref.No.	Part No.	Description			Remark
R532	1-216-839-11	METAL CHIP	33K	5%	1/16W
R533	1-216-849-11	METAL CHIP	220K	5%	1/16W
R534	1-216-821-11	METAL CHIP	1K	5%	1/16W
R535	1-216-837-11	METAL CHIP	22K	5%	1/16W
R536	1-216-841-11	METAL CHIP	47K	5%	1/16W
		< SWITCH >			
S401	1-572-473-11	SWITCH, TACTIL (RESET)			
		< VIBRATOR >			
X402	1-579-650-11	VIBRATOR, CRYSTAL (20MHz)			
**********					
*	A-3679-458-A	POWER BOARD, COMPLETE			
		**********			
		< CAPACITOR >			
C601	1-104-607-11	ELECT CHIP	47uF	20%	16V
C602	1-104-607-11	ELECT CHIP	47uF	20%	16V
C603	1-104-606-11	ELECT CHIP	150uF	20%	10V
C604	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C605	1-126-394-11	ELECT CHIP	10uF	20%	16V
C606	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C607	1-104-606-11	ELECT CHIP	150uF	20%	10V
C608	1-104-607-11	ELECT CHIP	47uF	20%	16V
C609	1-137-294-11	FILM CHIP	0.01uF	5%	16V
C610	1-126-403-11	ELECT CHIP	3.3uF	20%	50V
C611	1-104-607-11	ELECT CHIP	47uF	20%	16V
C612	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C613	1-126-394-11	ELECT CHIP	10uF	20%	16V
C614	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C615	1-128-414-21	ELECT CHIP	220uF	20%	6.3V
C616	1-126-394-11	ELECT CHIP	10uF	20%	16V
C617	1-164-695-11	CERAMIC CHIP	0.0022uF	5%	50V
C618	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C619	1-126-394-11	ELECT CHIP	10uF	20%	16V
C620	1-128-406-11	ELECT	33uF	20%	50V
C621	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C622	1-104-607-11	ELECT CHIP	47uF	20%	16V
C623	1-128-414-21	ELECT CHIP	220uF	20%	6.3V
C624	1-104-607-11	ELECT CHIP	47uF	20%	16V
		< CONNECTOR >			
CN601	1-695-859-21	CONNECTOR 10P (EXT BUS)			
CN602	1-573-220-11	PIN, CONNECTOR 10P			
*CN603	1-695-589-11	CONNECTOR 40P (IC CARD CONNECTOR 2)			
*CN604	1-695-834-11	PIN, CONNECTOR 26P			
*CN605	1-695-834-11	PIN, CONNECTOR 26P			

Ref.No.	Part No.	Description	Remark
*CN606	1-580-110-11	SOCKET, CONNECTOR 3P	
*CN607	1-580-110-11	SOCKET, CONNECTOR 3P	
*CN608	1-695-831-21	PIN, CONNECTOR 4P	
		< DIODE >	
D601	8-719-977-22	DIODE DTZ9.1	
D602	8-719-400-18	DIODE MA152WK	
D606	8-719-975-33	DIODE RB110C	
D613	8-719-210-56	DIODE EC10QS10	
		< FILTER >	
FIL601	1-239-466-21	FILTER, EMI	
		< IC >	
IC601	8-759-521-35	IC TL5001CD	
IC603	8-759-521-35	IC TL5001CD	
IC604	8-759-979-50	IC FA7610N	
IC605	8-759-630-68	IC M5247FP	
IC609	8-759-097-40	IC RH5RA31AA-T1	
IC610	8-759-097-42	IC RH5RA33AA-T1	
		< JACK >	
J601	1-573-180-11	JACK, DC (DC IN 6V)	
		< COIL >	
L601	1-402-837-21	COIL, CHOKE 47uH	
L603	1-402-776-21	COIL, CHOKE 340mH	
L604	1-402-775-21	COIL, CHOKE 47uH	
L605	1-402-774-21	COIL, CHOKE 470uH	
		< TRANSISTOR >	
Q602	8-729-805-25	TRANSISTOR 2SB1121	
Q603	8-729-924-46	TRANSISTOR DTC124XU	
Q604	8-729-805-25	TRANSISTOR 2SB1121	
Q607	8-729-216-22	TRANSISTOR 2SA1162-G	
Q608	8-729-924-59	TRANSISTOR DTC143ZU	
Q609	8-729-805-25	TRANSISTOR 2SB1121	
Q610	8-729-924-46	TRANSISTOR DTC124XU	
Q611	8-729-800-37	TRANSISTOR 2SD1048-X7	
Q612	8-729-019-04	TRANSISTOR MPL1	
Q614	8-729-924-59	TRANSISTOR DTC143ZU	
Q616	8-729-017-65	FET 2SK1764	
Q617	8-729-924-46	TRANSISTOR DTC124XU	
Q618	8-729-924-46	TRANSISTOR DTC124XU	
Q620	8-729-924-46	TRANSISTOR DTC124XU	
		< RESISTOR >	
R601	1-809-985-21	THERMISTOR NTH 5G36B682K02TE 6.8K	

Ref.No.	Part No.	Description			Remark
R602	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R603	1-216-837-11	METAL CHIP	22K	5%	1/16W
R604	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R605	1-216-849-11	METAL CHIP	220K	5%	1/16W
R606	1-216-840-11	METAL CHIP	39K	5%	1/16W
R607	1-216-839-11	METAL CHIP	33K	5%	1/16W
R608	1-216-817-11	METAL CHIP	470	5%	1/16W
R609	1-218-290-11	METAL CHIP	6.2K	0.50%	1/16W
R610	1-216-823-11	METAL CHIP	1.5K	5%	1/16W
R613	1-216-845-11	METAL CHIP	100K	5%	1/16W
R614	1-216-828-11	METAL CHIP	3.9K	5%	1/16W
R615	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R616	1-216-808-11	METAL CHIP	82	5%	1/16W
R617	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R618	1-216-849-11	METAL CHIP	220K	5%	1/16W
R619	1-216-840-11	METAL CHIP	39K	5%	1/16W
R620	1-216-839-11	METAL CHIP	33K	5%	1/16W
R621	1-216-817-11	METAL CHIP	470	5%	1/16W
R622	1-218-716-11	METAL CHIP	10K	0.50%	1/16W
R623	1-218-704-11	METAL CHIP	3.3K	0.50%	1/16W
R626	1-216-851-11	METAL CHIP	330K	5%	1/16W
R627	1-216-837-11	METAL CHIP	22K	5%	1/16W
R628	1-216-851-11	METAL CHIP	330K	5%	1/16W
R629	1-216-845-11	METAL CHIP	100K	5%	1/16W
R630	1-218-738-11	METAL CHIP	82K	0.50%	1/16W
R631	1-218-708-11	METAL CHIP	4.7K	0.50%	1/16W
R632	1-216-823-11	METAL CHIP	1.5K	5%	1/16W
R633	1-216-845-11	METAL CHIP	100K	5%	1/16W
R635	1-216-845-11	METAL CHIP	100K	5%	1/16W
R637	1-216-178-00	METAL GLAZE	150	5%	1/8W
R638	1-216-845-11	METAL CHIP	100K	5%	1/16W
R639	1-216-845-11	METAL CHIP	100K	5%	1/16W
R640	1-216-166-00	METAL GLAZE	47	5%	1/8W
R641	1-216-828-11	METAL CHIP	3.9K	5%	1/16W
R642	1-216-833-11	METAL CHIP	10K	5%	1/16W
R643	1-216-857-11	METAL CHIP	1M	5%	1/16W
R644	1-216-857-11	METAL CHIP	1M	5%	1/16W
R645	1-218-736-11	METAL CHIP	68K	0.50%	1/16W
R646	1-218-736-11	METAL CHIP	68K	0.50%	1/16W
R647	1-216-836-11	METAL CHIP	18K	5%	1/16W
R648	1-218-684-11	METAL CHIP	470	0.50%	1/16W
R649	1-216-836-11	METAL CHIP	18K	5%	1/16W
		< SWITCH >			
S601	1-554-439-00	SWITCH, PUSH (1 KEY) (POWER)			
S602	1-572-467-11	SWITCH, PUSH (1 KEY) (CARD LID DET)			

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Ref.No.	Part No.	Description			Remark
*	A-3679-461-A	RF BOARD, COMPLETE			
		**********			
		< BAND PASS FILTER >			
BPF201	1-239-460-11	FILTER, BAND PASS			
		< CAPACITOR >			
C201	1-162-938-11	CERAMIC CHIP	7PF	0.5PF	50V
C202	1-164-830-11	CERAMIC CHIP	1uF	22%	16V
C203	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
C204	1-164-830-11	CERAMIC CHIP	1uF	22%	16V
C205	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
C206	1-162-934-11	CERAMIC CHIP	3PF	0.25PF	50V
C207	1-104-608-11	ELECT CHIP	33uF	20%	6.3V
C208	1-162-932-11	CERAMIC CHIP	2PF	0.25PF	50V
C210	1-162-936-11	CERAMIC CHIP	5PF	0.25PF	50V
C211	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
C212	1-162-930-11	CERAMIC CHIP	1PF	0.25PF	50V
C213	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
C214	1-162-941-11	CERAMIC CHIP	10PF	0.5PF	50V
C215	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C216	1-162-931-11	CERAMIC CHIP	1.5PF	0.25PF	50V
C217	1-162-930-11	CERAMIC CHIP	1PF	0.25PF	50V
C222	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C223	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C231	1-162-945-11	CERAMIC CHIP	22PF	5%	50V
C232	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C233	1-162-941-11	CERAMIC CHIP	10PF	0.5PF	50V
C234	1-164-830-11	CERAMIC CHIP	1uF	22%	16V
C235	1-162-936-11	CERAMIC CHIP	5PF	0.25PF	50V
C236	1-162-941-11	CERAMIC CHIP	10PF	0.5PF	50V
C237	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C238	1-164-830-11	CERAMIC CHIP	1uF	22%	16V
C239	1-162-943-11	CERAMIC CHIP	15PF	5%	50V
C240	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C241	1-164-830-11	CERAMIC CHIP	1uF	22%	16V
C242	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C243	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
C245	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C250	1-104-610-11	ELECT CHIP	47uF	20%	4V
C251	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C252	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
C253	1-162-932-11	CERAMIC CHIP	2PF	0.25PF	50V
C254	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C255	1-162-946-11	CERAMIC CHIP	27PF	5%	50V
C256	1-162-946-11	CERAMIC CHIP	27PF	5%	50V
C257	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C258	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V

RF

Ref.No.	Part No.	Description			Remark
C261	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C262	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C263	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C270	1-162-941-11	CERAMIC CHIP	10PF	0.5PF	50V
C271	1-137-302-11	FILM CHIP	0.047uF	5%	16V
C272	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C273	1-104-608-11	ELECT CHIP	33uF	20%	6.3V
C274	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C275	1-104-608-11	ELECT CHIP	33uF	20%	6.3V
C276	1-137-302-11	FILM CHIP	0.047uF	5%	16V
C281	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C282	1-126-394-11	ELECT CHIP	10uF	20%	16V
C283	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C291	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C292	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C293	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C294	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C295	1-104-610-11	ELECT CHIP	47uF	20%	4V
C296	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C297	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C298	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C300	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C301	1-126-391-11	ELECT CHIP	47uF	20%	6.3V
C302	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C303	1-126-392-11	ELECT CHIP	100uF	20%	6.3V
C304	1-126-391-11	ELECT CHIP	47uF	20%	6.3V
C305	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C306	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C307	1-104-609-11	ELECT CHIP	100uF	20%	4V
C308	1-137-302-11	FILM CHIP	0.047uF	5%	16V
C309	1-135-148-21	TANTAL. CHIP	1.5uF	20%	10V
C311	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
C312	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
C313	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
C320	1-162-931-11	CERAMIC CHIP	1.5PF	0.25PF	50V
C321	1-162-931-11	CERAMIC CHIP	1.5PF	0.25PF	50V
C331	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C332	1-162-946-11	CERAMIC CHIP	27PF	5%	50V
C333	1-162-932-11	CERAMIC CHIP	2PF	0.25PF	50V
C334	1-162-946-11	CERAMIC CHIP	27PF	5%	50V
C335	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C336	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C341	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C342	1-104-608-11	ELECT CHIP	33uF	20%	6.3V
		< CONNECTOR >			
CN201	1-691-843-11	CONNECTOR, COAXIAL			
CN202	1-573-221-21	PIN, CONNECTOR 10P			

Ref.No.	Part No.	Description			Remark
		< DIODE >			
D201	8-719-941-86	DIODE	DAN202U		
D221	8-719-026-34	LED	CL-170UR-CD		
D281	8-719-800-76	DIODE	1SS226		
		< IC >			
IC201	8-759-083-76	IC	MB1529-T1		
IC202	8-759-083-74	IC	MC3372MR		
IC203	8-759-031-58	IC	SC7SU04F		
IC204	8-759-070-51	IC	SN74HCU04ADB		
IC205	8-759-156-58	IC	TK11445M		
IC206	8-759-084-01	IC	TK11435MTR		
		< IFT >			
IFT201	1-402-773-11	TRANSFORMER, IF			
		< COIL >			
L201	1-412-726-91	INDUCTOR	15nH		
L211	1-412-726-91	INDUCTOR	15nH		
L231	1-412-726-91	INDUCTOR	15nH		
L232	1-412-726-91	INDUCTOR	15nH		
L233	1-412-726-91	INDUCTOR	15nH		
L241	1-414-168-91	INDUCTOR	27uH		
L251	1-414-168-91	INDUCTOR	27uH		
L252	1-414-169-91	INDUCTOR	47uH		
L261	1-414-168-91	INDUCTOR	27uH		
L271	1-412-726-91	INDUCTOR	15nH		
L272	1-414-168-91	INDUCTOR	27uH		
L291	1-414-168-91	INDUCTOR	27uH		
L311	1-412-029-11	INDUCTOR CHIP	10uH		
L312	1-412-032-11	INDUCTOR CHIP	100uH		
L331	1-414-169-91	INDUCTOR	47uH		
		< TRANSISTOR >			
Q201	8-729-926-50	FET	FHX35LG		
Q202	8-729-230-60	TRANSISTOR	2SA1586-YG		
Q211	8-765-920-02	FET	3SK166-2		
Q221	8-729-402-84	TRANSISTOR	XN4601		
Q271	8-729-220-93	FET	2SK209-G		
Q272	8-729-402-84	TRANSISTOR	XN4601		
Q331	8-729-809-76	TRANSISTOR	2SC3142-J3		
		< RESISTOR >			
R200	1-216-797-11	METAL CHIP	10	5%	1/16W
R201	1-216-821-11	METAL CHIP	1K	5%	1/16W
R202	1-216-841-11	METAL CHIP	47K	5%	1/16W
R203	1-216-833-11	METAL CHIP	10K	5%	1/16W
R204	1-216-837-11	METAL CHIP	22K	5%	1/16W

Ref.No.	Part No.	Description			Remark
R205	1-216-801-11	METAL CHIP	22	5%	1/16W
R206	1-216-821-11	METAL CHIP	1K	5%	1/16W
R207	1-216-809-11	METAL CHIP	100	5%	1/16W
R208	1-216-821-11	METAL CHIP	1K	5%	1/16W
R209	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R210	1-216-832-11	METAL CHIP	8.2K	5%	1/16W
R211	1-216-821-11	METAL CHIP	1K	5%	1/16W
R212	1-216-821-11	METAL CHIP	1K	5%	1/16W
R213	1-216-833-11	METAL CHIP	10K	5%	1/16W
R214	1-216-839-11	METAL CHIP	33K	5%	1/16W
R215	1-216-801-11	METAL CHIP	22	5%	1/16W
R216	1-216-797-11	METAL CHIP	10	5%	1/16W
R217	1-216-817-11	METAL CHIP	470	5%	1/16W
R218	1-216-797-11	METAL CHIP	10	5%	1/16W
R219	1-216-817-11	METAL CHIP	470	5%	1/16W
R220	1-216-811-11	METAL CHIP	150	5%	1/16W
R221	1-216-837-11	METAL CHIP	22K	5%	1/16W
R222	1-216-845-11	METAL CHIP	100K	5%	1/16W
R223	1-216-809-11	METAL CHIP	100	5%	1/16W
R224	1-216-821-11	METAL CHIP	1K	5%	1/16W
R225	1-216-833-11	METAL CHIP	10K	5%	1/16W
R226	1-216-845-11	METAL CHIP	100K	5%	1/16W
R227	1-216-845-11	METAL CHIP	100K	5%	1/16W
R231	1-216-797-11	METAL CHIP	10	5%	1/16W
R232	1-216-803-11	METAL CHIP	33	0.5%	1/16W
R233	1-216-797-11	METAL CHIP	10	5%	1/16W
R241	1-216-797-11	METAL CHIP	10	5%	1/16W
R242	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R243	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R244	1-218-668-11	METAL CHIP	100	0.5%	1/16W
R245	1-218-668-11	METAL CHIP	100	0.5%	1/16W
R251	1-216-797-11	METAL CHIP	10	5%	1/16W
R253	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R254	1-216-841-11	METAL CHIP	47K	5%	1/16W
R261	1-216-809-11	METAL CHIP	100	5%	1/16W
R262	1-216-857-11	METAL CHIP	1M	5%	1/16W
R263	1-216-797-11	METAL CHIP	10	5%	1/16W
R264	1-216-809-11	METAL CHIP	100	5%	1/16W
R271	1-216-821-11	METAL CHIP	1K	5%	1/16W
R272	1-216-797-11	METAL CHIP	10	5%	1/16W
R273	1-216-797-11	METAL CHIP	10	5%	1/16W
R274	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R275	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R276	1-216-823-11	METAL CHIP	1.5K	5%	1/16W
R277	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R278	1-216-821-11	METAL CHIP	1K	5%	1/16W
R279	1-218-288-11	METAL GLAZE	300	5%	1/16W
R280	1-216-800-11	METAL GLAZE	18	5%	1/16W
R281	1-218-288-11	METAL GLAZE	300	5%	1/16W
R282	1-216-833-11	METAL CHIP	10K	5%	1/16W
R283	1-216-821-11	METAL CHIP	1K	5%	1/16W
R291	1-216-805-11	METAL CHIP	47	5%	1/16W
R292	1-216-857-11	METAL CHIP	1M	5%	1/16W
R293	1-216-823-11	METAL CHIP	1.5K	5%	1/16W
R294	1-216-821-11	METAL CHIP	1K	5%	1/16W
R296	1-216-817-11	METAL CHIP	470	5%	1/16W
R297	1-216-823-11	METAL CHIP	1.5K	5%	1/16W
R311	1-216-831-11	METAL CHIP	6.8K	5%	1/16W
R312	1-216-831-11	METAL CHIP	6.8K	5%	1/16W
R313	1-216-831-11	METAL CHIP	6.8K	5%	1/16W
R314	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R315	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R316	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R317	1-216-821-11	METAL CHIP	1K	5%	1/16W
R331	1-216-809-11	METAL CHIP	100	5%	1/16W
R332	1-216-837-11	METAL CHIP	22K	5%	1/16W
R333	1-216-833-11	METAL CHIP	10K	5%	1/16W
R334	1-216-817-11	METAL CHIP	470	5%	1/16W
R335	1-216-821-11	METAL CHIP	1K	5%	1/16W
R341	1-216-164-00	METAL GLAZE	39	5%	1/8W

< OSCILLATION UNIT >

TCX201	1-466-836-11	OSCILLATION UNIT, CRYSTAL (18.414MHz)
VCO201	1-466-837-11	OSCILLATION UNIT

****

MISCELLANEOUS

****

2	1-696-676-11	CORD (WITH PLUG)
12	1-809-885-11	ELEMENT, ELECTRO LUMINESCENCE
13	1-809-380-31	LCD UNIT
14	1-466-838-11	KEY BOARD UNIT
75	1-696-757-11	CABLE (WITH CONNECTOR)
*122	1-696-054-11	CABLE (WITH CONNECTOR) (LNA)
*123	1-590-985-11	CABLE (WITH CONNECTOR)
SP601	1-504-165-11	SPEAKER (3.6CM)
⚠BATT101	1-528-425-11	BATTERY, LITHIUM
⚠BATT401	1-528-432-11	BATTERY, LITHIUM

****

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	Les components identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

Ref.No.	Part No.	Description	Remark
		ACCESSORIES & PACKING MATERIALS	
		******	
	1-696-676-21	CORD (WITH PLUG)	
	3-384-012-01	SCREW (CONNECTOR), FITTING	
	3-388-059-01	FASTENER (A), MAGIC	
	3-388-060-01	FASTENER (B), MAGIC	
	3-388-476-01	CASE, CARRYING	
	3-389-562-01	SHEET (L), ADHESIVE	
	3-756-359-11	MANUAL, INSTRUCTION (FRENCH) (CND, AEP, UK, E, JE)	
	3-756-359-21	MANUAL, INSTRUCTION (ENGLISH) (US)	
	3-756-359-31	MANUAL, INSTRUCTION (ENGLISH) (AEP)	
	3-756-359-41	MANUAL, INSTRUCTION (GERMAN) (AEP, JE)	
	3-756-359-51	MANUAL, INSTRUCTION (SPANISH) (AEP, UK, E, JE)	
	3-756-359-61	MANUAL, INSTRUCTION (ITALIAN) (AEP, UK, E)	
	3-756-359-71	MANUAL, INSTRUCTION (DUTCH) (AEP)	
	3-756-359-81	MANUAL, INSTRUCTION (ENGLISH) (CND, AEP, UK, E, JE)	
	3-798-125-41	MANUAL, INSTRUCTION (ENGLISH) (AUS)	
	X-3365-888-1	CASE (BATT) ASSY	
*	3-389-306-01	INDIVIDUAL CARTON	
	3-904-016-01	BELT, CARRYING	
	X-3366-468-1	STRAP ASSY, HAND	
	X-3369-820-1	CARD ASSY, UTM (AUS)	

****

****
HARDWARE LIST
****

#1	7-628-253-00	+PSW 2X4
#2	7-685-102-19	SCREW +P 2X4 TYPE2 NON-SLIT
#3	7-685-138-19	SCREW +P 2.6X16 TYPE2 NON-SLIT

IPS-760

SONY

SERVICE MANUAL

US Model
Canadian Model
AEP Model
E Model
Tourist Model
UK Model
Australian Model

SUPPLEMENT-1

File this supplement with the service manual.

Additional of test mode

[SERVICE mode]

- In the SERVICE mode, the following items can be confirmed:
  (1) ROM version
  (2) RAM read/write operation
  (3) ROM checksum
  (4) Receiver status
  (5) Satellite channel setting
  (6) Liquid crystal display condition
  (7) External outputs

- To activate the SERVICE mode
  (1) Turn on the POWER switch, and make sure that the POS mode screen is displayed. ("POS" is displayed on the upper left of screen.)
  (2) Press the [MENU]+[F4] keys. (Keep pressing both keys simultaneously.) Then, the SERVICE mode will become active.
  (3) The screen to confirm the version, RAM read/write operation and ROM checksum is displayed.

```
      SERVICE mode ver. 1.00
            (C) Sony Corp. 1993

RAM  vram0: XXXX     vram1: XXXX
       data0: XXXX     data1: XXXX
       work0: XXXX     work1: XXXX

ROM_checksum : XXXX

KD   : ver. 1.30A
OS   : ver. XXX
APL  : APLv XX.XX


       Press <Enter>

END
```

(Vram 0 and Vram 1 : IC404
  data 0 and data 1 : IC408
  work 0 and work 1 : IC403)

On this screen, the KD version, OS version and application version are displayed respectively.
The RAM read/write results are displayed on the upper part of screen. Confirm that "OK!" is displayed to all items.

(4) Press the [ENTER] key. (If [F1] key is pressed here, the screen is returned to normal mode.)

(5) The receiver monitor screen is displayed.

```
version:SONY 71
"93 07 06 (TUE) UTC    04:59:12
LAT  :  n 00 00.000'
LON  :  E000 00.000
ALT  :  ±0000m
VEL  :  000 km/h       HD : +000
CAL  :  '93 06.29      07 : 39 : 10
DOP  :  100 (2-D)
GEO  :  XXXX(Note2)
CH  SV  ELV  AZ   STATUS  LEVEL
 1  19  +70  +70  SCAN      2
 2  27  +60 +160  SCAN      2
 3  13  +40  -60  SCAN      2
 4  18  +30  +10  SCAN      1
 5   2  +20 -160  SCAN      2
 6  21  -40 +160  SCAN      2
 7  23  -50 -150  SCAN      2
 8  24  -50 -120  SCAN      1
PLL : UNLOCK
```

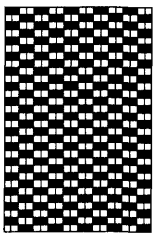
On this screen, various conditions of receiver can be checked.
Note 1: If the OS version number is smaller than 38, the display for PLL will be different. Ignore it.
Note 2: The coordinate system can only be displayed on the WGS-84 and in Tokyo. Otherwise, only the underline is displayed.

(6) Press the [F1] key.
(7) The satellite channel setting screen is displayed.

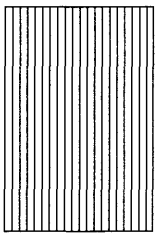
```
GPS_chennel setting.

   set channel : [1]




Select with up/down key.
Then press <Enter>.
return
```

Change channel with cursor keys [↑], [↓] and set channel by pressing the [ENTER] key.

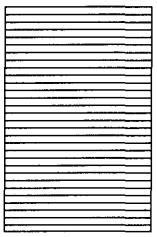
(8) When [F1] key is pressed, the receiver monitor screen shown in (5) is displayed again.
(9) Press the [ENTER] key.
(10) The liquid crystal display check screen is displayed.
On the LCD check screen, 3 kinds of patterns can selectively displayed.
Select respective patterns to check for evidence of dot skip or crosstalk.



① Checkered pattern screen.
If the screen is blank, confirm by adjusting the concentration of liquid crystal with ZOOM [+] or [−] key.

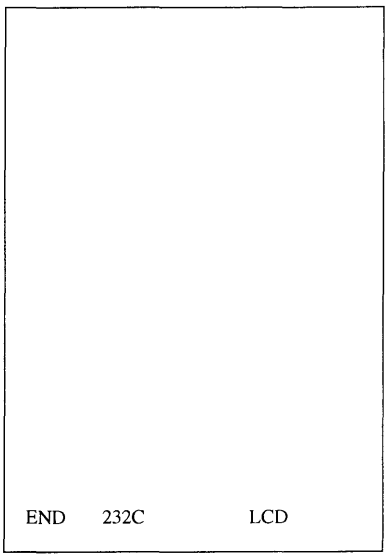


② This screen is displayed when pressing the cursor key [↑].



③ This screen is displayed when pressing the cursor key [↓].

(11) Press the ENTER key.



On this screen, LED and external outputs can be checked.

- LED check
  GPS LED (green/red) and MARK LED light up simultaneously.
- Press the [F2] key.
  The receiver output is directly present at the external output terminal (EXT BUS CN601).
- Press the [F4] key.
  LCD data is output from the external output terminal (EXT BUS CN601).

(12) The SERVICE mode quits when [F1] key is pressed.
(To return to the receiver monitor screen shown in (5), press the [ENTER] key.)

English
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